Prohibitory Regulation

Operational Control

Facility Information

IRC:67-2022

CODE OF PRACTICE FOR ROAD SIGNS

(Fourth Revision)

INDIAN ROADS CONGRESS

2022

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FOR
ROAD SIGNS

(Fourth Revision)

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CONTENTS

S.No.	Description	Page No.
	Personnel of the Highways Specifications and Standards Committee	i-ii
1.	Introduction	1
2.	General	2
3.	Classification of Road Signs	4
4.	Siting of Signs with respect to Carriageway	5
5.	Orientation of Signs	8
6.	Material for Signs	9
7.	Posts and Mountings for Signs	19
8.	Colour for Signs	20
9.	Size of Signs	22
10.	Definition Plates/Supplementary Plates	22
11.	Visibility of Signs	22
12.	Size of Letters	23
13.	Maintenance of Signs	25
14.	Mandatory/Regulatory Signs	26
15.	Cautionary/Warning Signs	38
16.	Informatory Signs	48
17.	Facility Information Signs	54
18.	Parking Information Signs and Flood Gauge	59
19.	Signs for Differently Abled Persons	61
20.	Enforcement related Signs	61
21.	Variable Message Signs	62
22.	Route Marker Signs	64
23.	Signs for Expressways	67
24.	Signs for Urban and City Roads	69
25.	Toll Plaza related Signs	71

S.No.	Description	Page No.
26.	Black Spot related Signs	72
27.	Sign Plan Examples for Typical Situations	72
Plate-I		
	Stop and Give Way Signs	77
	Prohibitory Signs	78
	No Parking and No Stopping Signs	83
	Vehicle Control Signs and Speed Limit	84
	Restriction End Sign	85
	Compulsory Control and Other Signs	86
Plate-II		
	Cautionary/Warning Signs	89
Plate-III		
	Informatory Signs	105
Plate-IV		
	Tourism related Signs	115
Plate-V		
	Facility Information Signs	119
	Parking Signs	127
	Signs for Differently Abled Persons	129
	Enforcement related Signs	132
	Route Marker Signs	137
Plate-VI		
	Signs related to Urban Scenario	138
Plate-VII		
	Toll Plaza related Signs	140
Plate-VIII		
	Use of Symbols and Icons in Direction Signs	142

S.No.	Description	Page No.
Annexure-I	List of Mandatory/Regulatory Signs	145
Annexure-II	List of Cautionary/Warning Signs	147
Annexure-III	Rules and Technical Advisory for Design of Informatory Road Signs	149
Annexure-IV	Facility Information Signs	156
Annexure-V	Figs. V.1 to V.15	159
Annexure-VI	Determination of "X" Height for Direction Signs (Shoulder & Gantry Mounted)	175
Annexure-VII	Format for Recording Sign Installation Information for Maintenance Purpose	177
Annexure-VIII	Recording Format for Periodic Testing of Retro Reflectivity	178

LIST OF FIGURES

S.No.	Description	Page No.
Fig. 3.1	Example of Mandatory/Regulatory Signs	4
Fig. 3.2	Example of Cautionary/Warning Signs	4
Fig. 3.3	Example of Informatory/Guide Signs	5
Fig. 4.1	Typical Siting of Signs with respect to Carriageway (Heights and Clearances)	8
Fig. 5.1	Sign Orientation with respect to Carriageway	8
Fig. 6.1	Description of Observation Angle	11
Fig. 6.2	Description of Entrance Angle	11
Fig. 11.1	Backing Board with Fluorescent Yellow Colour for Pedestrian Crossing	23
Fig. 14.1	Description of Visibility Funnel	27
Fig. 14.2	Location Description of STOP Sign	28
Fig. 14.3	Location Description of GIVE WAY Sign	29
Fig. 14.4	Gateway Signs at the Approach/Entrance to a Town or Village	36
Fig. 21.1	Typical Variable Message Sign Board (VMS)	64
Fig. 26.1	Crash Prone Area Informatory Sign	72

LIST OF TABLES

S.No.	Description	Page No.
Table 4.1	Heights and Clearances required for Sign Placement	7
Table 6.1	Specifications for Aluminum Composite Material (ACM)	10
Table 6.2	Suggested Guidelines for Usage of Retro-Reflective Sheeting	12
Table 6.3	Acceptable Minimum Coefficient of Retro-Reflection for Type I Engineering Grade Sheeting (Candela per Lux per Square Metre)	13
Table 6.4	Acceptable Minimum Coefficient of Retro-Reflection for Type II Super Engineering Grade Sheeting (Candela per Lux per Square Metre)	13
Table 6.5	Acceptable Minimum Coefficient of Retro-Reflection for Type III High Intensity Grade Sheeting[A] (Candela per Lux per Square Metre)	14
Table 6.6	Acceptable Minimum Coefficient of Retro-Reflection for Type IV High Intensity Micro-Prismatic Grade Sheeting[A] (Candela per Lux per Square Metre)	14
Table 6.7	Acceptable Minimum Coefficient of Retro-Reflection for Type VIII Prismatic Grade Sheeting[A] (Candela per Lux per Square Metre)	15
Table 6.8	Acceptable Minimum Coefficient of Retro-Reflection for Type IX Prismatic Grade Sheeting[A] (Candela Per Lux Per Square Metre)	16
Table 6.9	Acceptable Minimum Coefficient of Retro-Reflection for Type XI Prismatic Grade Sheeting[A] (Candela per Lux per Square Metre)	16
Table 8.1	Chromaticity Coordinates for Different Colours	20
Table 8.2	Daytime Luminance Factor (Y%)	21
Table 8.3	Colour Pattern for Direction Information Signs	21
Table 12.1	Letter Size and Siting of Information Signs (Shoulder & Overhead Mounted)#	24
Table 14.1	Sizes and Dimensions of 'STOP' Sign	27
Table 14.2	Distances in Visibility Funnel under Different Speeds on Major Road	27
Table 14.3	Sizes and Dimensions of 'GIVE WAY' Sign	28
Table 14.4	Size and Dimension of Mandatory/Regulatory Signs	29
Table 14.5	Placement of Repeater Sign on Urban Roads	35
Table 14.6	Dimensions of Compulsory Direction Control Sign	36

S.No.	Description	Page No.
Table 15.1	Sizes and Dimensions of Cautionary/Warning Sign & Siting Distances	38
Table 15.2	Spacing between Chevron Sign Boards	47
Table 16.1	Types of Mounting Forms for Direction Signs and Suggested Usage Guidelines	49
Table 23.1	Font Type for Inscription in Expressway Signs	67
Table 23.2	Sizes of Different Types of Signs on Expressways	68
Table 24.1	Font Type for Inscription in Signs of Urban/City Roads	69

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2	Director General (Road Development) & Special Secretary to Govt. of India	(Pandey, I.K.), Ministry of Road Transport and Highways, New Delhi
3	Secretary General, Indian Roads Congress	(Nirmal, Sanjay Kumar), Additional Director General, Ministry of Road Transport and Highways, New Delhi

CODE OF PRACTICE FOR ROAD SIGNS

1. INTRODUCTION

1.1 Road signs, which have the backing of law in India, are incorporated in the Motor Vehicles Act, 1988 and The Motor Vehicles (Amendment) Act, 2019

1.2 The Motor Vehicles Act. 1988 and The Motor Vehicles (Amendment) Act, 2019 has covered all the signs warranted by different traffic situations. The designs of signs are fully dimensioned. Further, the signs have uniformity, and mostly symbols are used to convey the message, especially in the case of regulatory signs.

1.3 The IRC Code of Practice for Road Signs sets out the methodology to be followed in the use, siting, construction and maintenance of the road signs for all categories of roads including expressways. The road signs adopted in this code are in harmony with Protocol on Road Signs and Signals of United Nations Conference on Road and Motor Transport, 1949 and Vienna Convention on Road Signs and Signals, 1968.

1.4 The Fourth Revision of IRC Code of Practice for Road Signs was reviewed by the Transport Planning and Traffic Engineering Committee (H-1) of the Indian Roads Congress (IRC) in its meeting held on 25th May, 2018 and subsequently it constituted a subgroup under the convenorship of Dr. Errampalli Madhu and including Dr. S. Velmurugan, Dr. K. Ramachandra Rao and Shri Swatantra Kumar as subgroup members to review the code and suggest modifications/ amendments if any required. The significant help was also rendered by Shri Pramod Bhaskar to the sub-group in preparing the draft code. The subgroup reviewed the code in detail and restructured it by relating size and spacing of signs with respect to design speed of the road, including guidelines for the selection of retro-reflective sheeting, incorporating some new signs and including illustrative examples of sign plans for different commonly occurring situations. The H-1 Committee decided to merge four IRC Codes i.e. IRC:2-1968 "Route Marker Signs for National Highways" (First Revision), IRC:30-1968 "Standard Letters and Numerals of Different Heights for Use on Highway Signs", IRC:31-1969 "Route Marker Signs for State Routes" and IRC:SP:31-1992 "New Traffic Signs" in this Code. The modified draft Code was deliberated in a series of meetings and was finalized by the H-1 Committee in its meeting held on 29th May, 2020 after modifications based on comments of the members.

The composition of H-1 Committee is given below:

Chandra, Dr. Satish	.....	Convenor
Ram, Dr. Sewa	.....	Co-Convenor
Madhu, Dr. E.	.....	Member-Secretary

Members

Chunduru, Venkata Subbarao	Director, NATPAC (Rep. by Shaheem S.)
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(Pandey, I.K.), Ministry of Road
Transport & Highways

Secretary General,
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(Nirmal, Sanjay Kumar), Additional
Director General, Ministry of Road
Transport & Highways

1.5 The revised draft Code was placed before the Highways Specifications and Standards Committee (HSS) in its meeting held on 12th September, 2020 and continued on 19th September, 2020 & 3rd October, 2020. The HSS Committee decided that the Convenor, H-1 Committee will modify the document based on written and verbal comments offered during the meeting and submit the final document to IRC for placing before the meetings of Executive Committee (EC) and Council. The modified code considering the suggestions of the HSS Committee was deliberated and approved by the EC in its meeting held on 18th February, 2021. The 221st Mid-Term Council in its meeting held on 20th – 21st February, 2021 considered and approved the draft revision of IRC:67 "Code of Practice for Road Signs" for printing.

2. GENERAL

2.1 Purpose of Road Signs

The purpose of the road signs is to promote road safety and efficiency by providing for the orderly movement of all types of road users moving on various categories of roads in both urban and non-urban areas. Road signs notify road users of regulations and provide warning as well as guidance needed for safe, uniform and efficient operation.

2.2 Principles of Road Signs

This Code contains the basic principles that govern the design and use of road signs for all categories of roads including expressways open to public travel irrespective of road agency having jurisdiction. It is important that these principles be given primary consideration in the selection and application of each road sign.

To be effective, a road sign should meet five basic requirements:

a) Fulfill a need;

b) Command attention;

c) Convey a clear and simple meaning;

d) Command respect from road users; and

e) Give adequate time for response.

Design, placement, operation, maintenance, and uniformity are aspects that should be carefully considered in order to maximize the ability of a road sign to meet these five basic requirements.

2.3 Placement and Operation of Road Signs

Placement of road signs should be within road user's view. To aid in conveying proper meaning, road signs should be positioned with respect to the location or situation to which it applies. The location and legibility of the road sign should be such as to provide adequate response time to road users to read and take action at the operating speed.

Road Signs or their supports (including front and back) shall not bear any form of advertisement or other message that is not related to traffic control. However, tourist-oriented directional signs and signs relating to specific wayside services and amenities should not be considered as advertising.

Road signs should be placed and operated in a consistent manner. Road signs which are not necessary or no longer required should be removed. The fact that a sign is in good physical condition should not be a basis for deferring the removal or change, if it is so warranted.

2.4 Uniformity of Road Signs

Uniformity of signs simplifies the task of the road user because it helps in recognition and understanding, thereby reducing perception/reaction time. Uniformity assists road users, traffic police and highway agencies by giving everyone the same interpretation message. Uniformity also promotes efficiency in manufacture, installation and maintenance. Uniformity means treating similar situations in a similar way. A standard sign, used where it is not appropriate, is as objectionable as a non standard sign.

2.5 Traffic Engineering Study

The decision to use a particular sign at a particular location should be made on the basis of traffic engineering study and after a very careful planning so that correct signs are placed at required locations.

Authorities with responsibility for traffic control that do not have in-house engineering assistance can take help from traffic engineering consultant(s) or academic and research institutions with domain expertise.

3. CLASSIFICATION OF ROAD SIGNS

Road Signs are classified under the following three heads:

3.1 Mandatory/Regulatory Signs

All Mandatory or Regulatory Signs are circular in shape. The exceptions in shape are the octagonal red STOP sign and the triangular GIVEWAY or YIELD sign. These two signs provide indication about right of way to drivers. The remaining Mandatory / Regulatory Signs may be broadly divided into the following categories as depicted in **Fig. 3.1.**

a) **Prohibitory Regulation** (having red circular border with red oblique bar)

b) **Operation Control/Vehicle Control** (having red circular border only)

c) **Compulsory Control and Other Signs** (circular sign having blue background with white border)

Fig. 3.1 Example of Mandatory/Regulatory Signs

Mandatory/Prohibitory Signs are to indicate the prohibition upon certain kind of vehicle maneuver and vehicle type like “overtaking prohibited” or “U-turn prohibited” or “cycles prohibited” and restriction on parking like “parking prohibited” and limit on vehicle speed and size like “speed limit” and “maximum load limit”. They are with red circular ring and diagonal bars with black symbols or arrows or letters on white background. The red ring indicates prohibitory regulation; and the diagonal red bar prohibits the action or movement indicated by the black symbol.

Mandatory signs giving positive instructions are circular with white symbol on a blue background with white border. They indicate what driver must do compulsorily. For example, direction control signs are to compulsorily regulate certain movements wherever the restriction applies.

Mandatory/Regulatory Signs need to be complied with and any violation of the rules and regulations conveyed by these signs is a legal offence. Examples of these signs are shown in **Fig. 3.1.**

3.2 Cautionary/Warning Signs

Cautionary/Warning signs are triangular in shape with red border and black symbol in white background used to caution and alert the road users to potential danger or existence of certain hazardous conditions either on or adjacent to the roadway so that they take the desired action. These signs indicate a need for special caution by road users and may require a reduction in speed or some other manoeuvre. Some examples of these signs are Hairpin Bend, Narrow Bridge, Gap in Median, School Ahead etc. An example is shown in **Fig. 3.2**.

Fig. 3.2 Example of Cautionary/Warning Signs

3.3 Informatory/Guide Signs

All guide signs and informatory signs for facilities are rectangular in shape. Informatory Signs for facilities indicate location and direction to facilities like "fuel station" or "eating place" or "parking" and shall be a symbol within a rectangular board with blue background.

Information signs in rectangular shape are also used with destination names and distances with arrows indicating the direction. The colour pattern of direction information sign is presented in **Table 8.3.** These are used to give such information to road users which will help them along the route in the simplest and direct manner. Examples of these are shown in **Fig. 3.3**.

Fig. 3.3 Example of Informatory/Guide Signs

3.4 Road Classifications

Generally, roads in India are classified as under:

a) Expressways

b) National Highways

c) State Highways

d) Major District Roads

e) Rural Roads [Other District Roads (ODR) and Village Roads(VR)]

f) Urban (City) Roads

The colour combinations for direction information signs for different categories of road shall be as given in **Table 8.3**.

4. SITING OF SIGNS WITH RESPECT TO CARRIAGEWAY

4.1 The road signs are the means of communication to the road users, especially drivers. Therefore, the signs shall be so placed that the drivers can recognize them easily and in time. Normally the signs shall be placed on the left hand side of the road. For two lane roads, normally the signs may be placed on the left side of the carriageway, repeated on the other side of the carriageway, if local conditions are such that the signs might not be seen in time by the drivers. For multilane divided roads the signs may be placed on the left side of each carriageway. In case of hill roads, the signs shall generally be installed on the valley side of the road, unless traffic and road conditions warrant these to be placed on the hill side.

4.2 On all roads with or without kerb and with shoulder, the extreme edge of the ground mounted sign adjacent to the roadway shall be at a distance of 600 mm to 3 m from the edge of the earthen shoulder depending upon the available Right of Way. For roads without shoulder, a

minimum clearance of 1 m from roadway edge shall be provided. For roads with kerbs, it shall not be less than 300 mm away from kerb line, but in no case shall any part of the sign act as an obstruction to vehicular traffic or acting as an obstacle hindering movement of pedestrians on the footpath.

Gantry mounted signs should be mounted on columns preferably 7 m or more from the nearest traffic lane, unless otherwise specified. The minimum lateral offset is intended to keep it away from vehicles that may use the shoulder striking the gantry column. If there is a situation where this lateral clearance cannot be maintained, the column of gantry sign shall be shielded with W-Beam crash barrier for required run out length depending upon the setback distance between the pavement edge line and column of gantry. Clearance distance not less than 1.8 m, shall be used on connecting roadways or ramps at interchanges.

4.3 On kerbed roads, the bottom edge of the lowest sign shall not be less than 2.1 m and not more than 2.5 m above the kerb. On roads without kerb, the bottom edge of the lowest sign shall not be less than 2 m and not more than 2.5 m above the crown of the pavement. Where signs are erected above footpaths or in areas likely or intended to be used by pedestrians, minimum headroom of 2.1 m is to be provided.

4.4 Where in the opinion of the competent authority, a sign would be ineffective if placed on the left hand side shoulder of a road with dual carriageway, it may be placed on the median instead. To improve the visibility of the signs on multi-lane roads, the minimum height of the lower edge of the sign should be kept as 2.5 m above the highest point of the carriageway.

4.5 The signs shall be so placed that these do not obstruct vehicular traffic on the carriageway, and if placed on the berm/footpath/refuge island should allow unhindered movement of pedestrians. The difference in level between the lower edge of the sign and the carriageway shall be as uniform as possible for signs of the same class on the same route.

4.6 On multi-lane roads, the signs may have to be mounted overhead, as this would ensure better visibility and be effective in communicating with the drivers and other road users. Overhead signs may be used in lieu of, or as an adjunct to, ground signs where the situation so warrants for proper information and guidance of the road user. The following conditions may be considered while deciding about the provision of overhead signs:

- Traffic volume at or near capacity
- Complex interchange design
- Three or more lanes in each direction
- Restricted visibility
- High speed traffic
- Insufficient space for ground mounted signs
- Large percentage of commercial vehicles
- Closely spaced interchanges

4.7 From safety and aesthetic standpoints, overhead signs shall be mounted on overhead bridge structures, wherever possible. Overhead signs shall provide a vertical clearance of not less than 5.5 m over the entire width of the pavement and shoulders. Where overhead sign supports cannot be placed at a safe distance away from the line of traffic or in an otherwise protected site, they should either be so designed as to minimize the impact forces or protect motorists adequately by the mandatory provision of a crash barrier or guard rail of suitable design. Encompassing all the above requirements, the siting of signs with respect to carriageway with required height and clearance is given in **Table 4.1** and **Fig. 4.1.**

4.8 Mandatory signs (e.g. Keep Left) on traffic islands are normally mounted so that the bottom edge is about 1000 mm above the paved surface. The same mounting pattern can be followed for street name boards which don't obstruct the movement of pedestrians (due to the parallel placement). When several signs have to be placed along the same section of road, take care that they do not obscure each other. Care shall be exercised to locate two successive signs at a minimum distance of 0.6*V metres apart (where V is design speed in Kmph) in the case of interurban roads, whereas for urban roads, a minimum distance of 20 m between two successive road signs shall be maintained. Signs are normally erected on the left side of the road, but for extra emphasis (like high traffic volume, critical locations, etc.), a second sign shall be placed on the right side of the road or on the median in the case of multilane divided carriageways. Such placement of additional sign on the median is especially useful to delineate left-hand curves using the 'Curve Ahead Sign' and similarly placement of additional sign for pedestrian crossings on median near school zones with emphasis on safety of vulnerable users. Wherever minimum lateral clearance cannot be maintained for gantry columns from shoulder edge line, such exposed column shall be protected with crash barrier.

Table 4.1 Heights and Clearances required for Sign Placement

	Minimum (mm)	Desirable (mm)	Maximum (mm)
A	600	1000	2500
B	1000	2000	3000
C	300	600	1000
D	2000	2000	2500
E	2100	2100	2500
F	5500	6000	6500
G	750		
H			5000
I	5000	7000	9000
J	1800	2000	2500

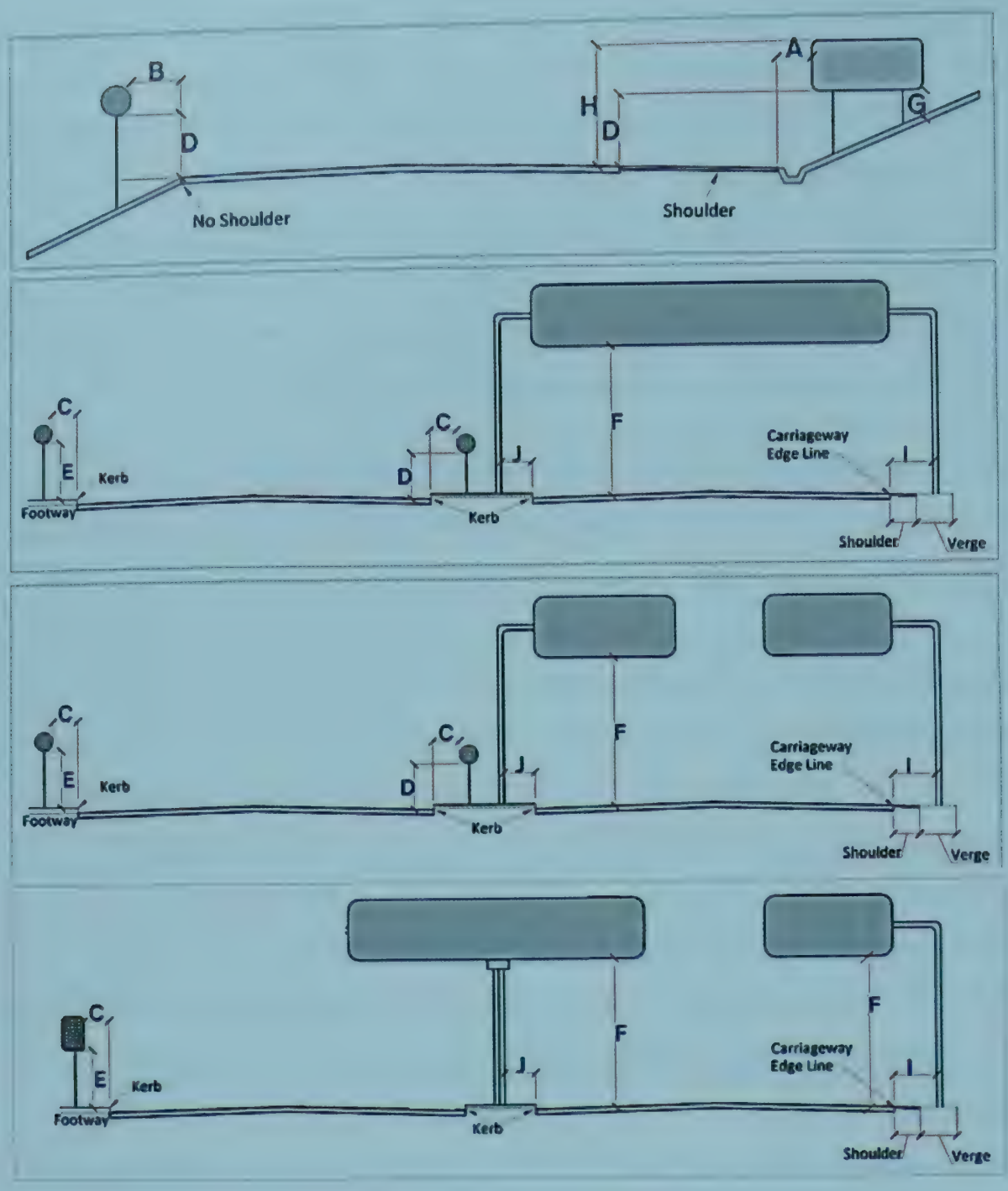


Fig. 4.1 Typical Siting of Signs with respect to Carriageway (Heights and Clearances)
(Refer Table 4.1 for values)

5. ORIENTATION OF SIGNS

5.1 The signs unless otherwise stated shall normally be placed at right angles to the line of travel of the approaching traffic. Signs relating to parking, however, should be fixed at an angle (approximately) 15° to the carriageway so as to give better visibility.

5.2 Where light reflection from the sign face is encountered to such an extent as to reduce legibility, the sign should be turned slightly away from the road as shown in **Fig. 5.1**.On horizontal curves, the sign should not be fixed normal to the carriageway, but the angle of placement should be determined with regard to the course of the approaching traffic.

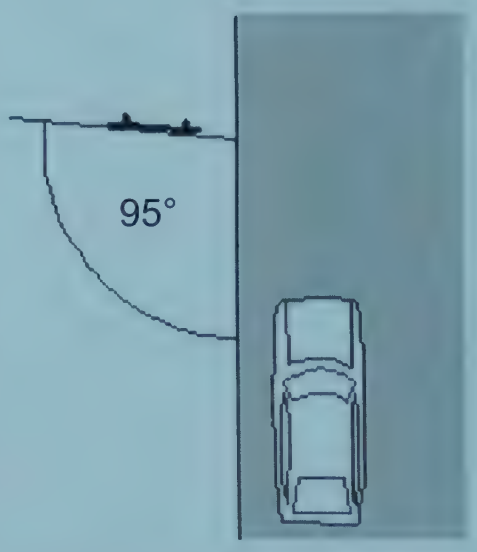


Fig. 5.1 Sign Orientation with respect to Carriageway

5.3 Sign faces are normally vertical, but on gradients it may be desirable to tilt a sign forward or backward from the vertical to make it normal to the line of sight and improve the viewing angle.

6. MATERIAL FOR SIGNS

The various materials and fabrication of road signs shall conform to the following requirements:

6.1 **Concrete:** Concrete shall be of M25 grade for foundation.

6.2 **Reinforcing Steel:** Reinforcing steel shall conform to the requirements of Indian Standards (IS 1786) unless otherwise specified.

6.3 **Bolts, Nuts and Washers:** High strength bolts shall conform to IS 1367 whereas precision bolts, nuts, etc. shall conform to IS 1364.

6.4 **Plates and Supports:** Plates and support sections for the sign posts shall conform to IS 226 and IS 2062 or any other stated IS specification. Concrete structures shall not be used for plates and supports.

6.5 **Substrate:** The substrate shall be either Aluminium sheeting or Aluminium Composite Material (ACM) conforming to the following subsections only.

6.5.1 *Aluminium*

Aluminium sheets used for sign boards shall be of smooth, hard and corrosion resistant Aluminium alloy conforming to IS 736 - Material Designation 24345.

6.5.2 *Aluminium Composite Materials (ACM)*

ACM sheets used for sign boards is a sandwiched construction with a thermoplastic core of 'Low Density Polyethylene' (LDPE) between two thick skins/sheets of Aluminium with overall thickness of 4 mm and 3 mm, and Aluminium skin thickness of 0.4 - 0.5 mm and 0.25 - 0.3 mm respectively on both sides. The retro reflective sheeting must be applied on the top surface with aluminium surface with recommended surface preparation from sheeting manufacturer. A fluorocarbon coating may be applied over the exposed surface of aluminium to ensure corrosion resistant and weatherability and shall conform to relevant American Society for Testing and Materials (ASTM). The mechanical properties of 4 mm and 3 mm ACM and that of its Aluminium skin shall conform to the requirement given in **Table 6.1**, when tested in accordance with the test methods mentioned against each of them.

6.6 **Plate Thickness**

Shoulder mounted ground signs with a maximum side dimension not exceeding 600 mm shall not be less than 1.5 mm thick with Aluminium and 3 mm thick with Aluminium Composite Material. All other signs shall be at least 2 mm thick with Aluminium and 4 mm thick with Aluminium Composite Material. The thickness of the sheet shall be related to the size of the sign and its support and shall be such that it does not bend or deform under prevailing wind and other loads.

All overhead signs made with Aluminium Composite Material shall be minimum 4 mm thick to withstand wind and other loads without deformation.

Table 6.1 Specifications for Aluminium Composite Material (ACM)

S. No.	Description	Specification for 4 mm		Specification for 3 mm
		Standard Test	Acceptable Value	Acceptable Value
A	**Mechanical Properties of ACM**			
1	Peel off strength with retro reflective sheeting (Drum Peel Test)	ASTM D 903	Min. 4 N/mm	Min. 4 N/mm
2	Tensile Strength	ASTM E 638	Min. 40 N/mm^2	Min. 30 N/mm^2
3	0.2% Proof Stress	ASTM E 638	Min. 34 N/mm^2	Min. 34 N/mm^2
4	Elongation	ASTM E 638	Min. 6 %	Min. 5 %
5	Flexural Strength	ASTM C 393	Min. 130 N/mm^2	Min. 120 N/mm^2
6	Shear strength with Punch Shear Test	ASTM D 732	Min. 18 N/mm^2	Min. 18 N/mm^2
B	**Properties of Aluminum Skin**			
1	Tensile Strength (Rm)	ASTM E 8	Min. 150 N/mm^2	Min. 130 N/mm^2
2	Modulus of Elasticity	ASTM E 8	Min. 70,000 N/mm^2	Min. 70,000 N/mm^2
3	Elongation	ASTM E 8	A_{50} Min. 2%	A_{50} Min. 2%
4	0.2 % Proof Stress	ASTM E 8	Min. 110 N/mm^2	Min. 110 N/mm^2

6.7 Retro Reflective Sheeting

The retro reflective sheeting used on the signs shall consist of white or coloured sheeting having a smooth outer surface which has the property of retro reflection over its entire surface. It shall be weather resistant and exhibit colour fastness. It shall be new and unused and show no evidence of cracking, scaling, and pitting, blistering, edge lifting or curling and shall have negligible shrinkage or expansion. A certificate of having the sheeting tested as per ASTM D 4956 for coefficient of retro reflection, daytime colour, colour fastness and luminance, shrinkage, flexibility, liner removal, adhesion, impact resistance, specular gloss and fungus resistance, night time colour, 3 years outdoor weathering and its having passed these tests shall be obtained from International/Government Laboratory/Institute by the manufacturer of the sheeting and in case the certificate is obtained from international agency, it should also be obtained from Indian agency within 3 years of launching of product by the manufacturer including actual outdoor weathering in Indian conditions. Alternatively, a certificate conforming to ASTM D 4956 specification on artificial accelerated weathering requirements from a reputed laboratory in India can be accepted provisionally. In such a situation, the Employer/Client, if so desires, could seek for a performance guarantee which would be released after the receipt of certificate meeting the requirement of three years outdoor weathering of the sheeting. Retro reflective sheeting is divided into three classes as follows:

CLASS A Sheeting: - Engineering and Super Engineering Grade Sheeting as per ASTM D 4956 Type I and II.

CLASS B Sheeting: - High Intensity and High Intensity Prismatic Grade Sheeting as per ASTM D 4956 Type III and IV.

CLASS C Sheeting: - All Micro Prismatic Grade Sheeting as per ASTM D 4956 Type VIII, IX and XI.

6.7.1 *Selection of Sheeting*

The performance characteristics of sheeting Type I to Type XI used for road signs are presented in **Table 6.3** to **Table 6.9**. The definition of key words in understanding the performance characteristics are given below.

Retro-reflection means the reflection of light which is returned in directions close to the direction from which it came and this property being maintained even over wide variations of the direction of the incident radiation:

Observation angle (α) is the angle between the illumination axis and the observation axis as shown in **Fig. 6.1.**

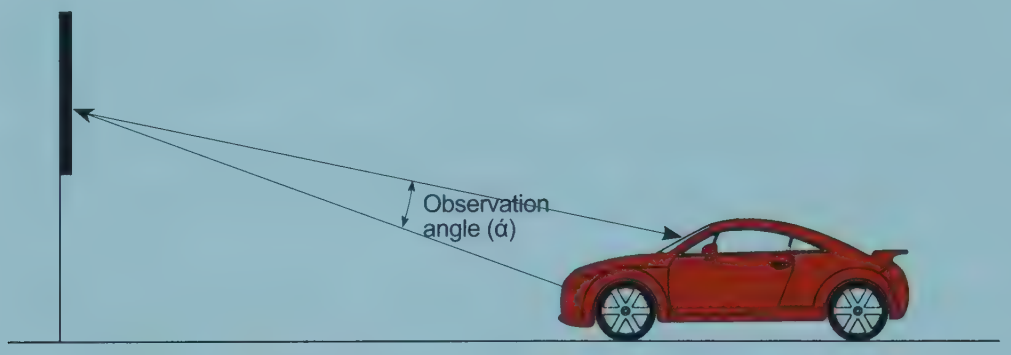


Fig. 6.1 Description of Observation Angle

Entrance angle (β) means the angle from the illumination axis to the reference axis. The reference axis is an axis perpendicular to the retro-reflective surface as shown in **Fig. 6.2.**

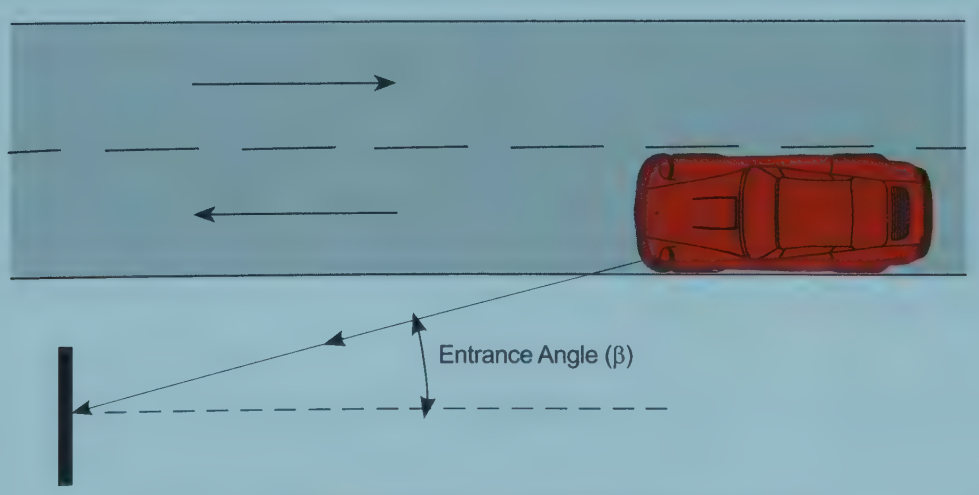


Fig. 6.2 Description of Entrance Angle

Coefficient of retro-reflection (R_A) is obtained from the luminous intensity (I) of the retro-reflective area in the direction of observation and the illuminance (E_v) on the retro-reflective plane at right angles to the direction of the incident light and the illuminated plane sample surface A as given in Eq. 6.1.

$$R_A = I / E_v * A \qquad (6.1)$$

where: R_A is coefficient of retro-reflection expressed in candela per lux per square meter ($cd.lx^{-1}.m^{-2}$).

Though the sheeting as per ASTM classification are available from Type I to Type XI, a "higher" type of sheeting used in the ASTM need not necessarily imply that it is better than a "lower" type sheeting, rather it meets different performance characteristics. Each type of sheeting has certain performance characteristics and the type of sheeting for a road should be selected which suits the situation encountered by road users in viewing the signs on the particular road. For example, sheeting with high coefficient of retro reflection at small observation angle will give better performance for driver's viewing the sign from long distances. Similarly, signs with wide observation angle give good performance for drivers encountering situations to observe the signs at short range distances. Thus, Class C Micro prismatic sheeting shall be preferred for the major category of roads like Expressways, National/State Highways and Urban Roads. Moreover, Type XI sheeting with observation angle of up to 1^0 shall be preferred while choosing Class C grade sheeting applications as it offers good visibility from short and medium range distances. Type IV micro prismatic sheeting may be used for delineator posts.

Table 6.2 presents a general guideline for selection of sheeting considering the performance characteristics of each type of sheeting for different categories of roads and also on economic consideration and visibility requirements in Indian context. However, the choice for selection of type of sheeting would rest with the client.

Table 6.2 Suggested Guidelines for Usage of Retro-Reflective Sheeting

Class of Sheeting	Type of Sheeting (ASTM)	Category of Road				
		Expressway	National / State Highway	Major District Roads	Other District Roads and Village Roads	Urban/ City Roads
CLASS A	Type I	No	No	No	Yes	No
CLASS B	Type IV	No	No#	Yes	Yes	No#
CLASS C	Type IX	No	No	Yes$	No	Yes
	Type XI	Yes	Yes	Yes$	No	Yes

 # - for Work Zone, Type IV can be used

$ - Optional: can be used based on site requirements

6.7.2 *Class A (Engineering Grade Sheeting)*

6.7.2.1 Type I Engineering Grade Sheeting

This sheeting shall be of enclosed lens glass bead type consisting of microscopic lens elements or microprismatic retroreflective elements. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum coefficient of retro-reflection determined in accordance with ASTM D 4956 which is indicated in **Table 6.3**.

Table 6.3 Acceptable Minimum Co-efficient of Retro-Reflection for Type I Engineering Grade Sheeting (Candela per Lux per Square Metre)

Observation Angle	Entrance Angle	White	Yellow	Orange	Green	Red	Blue	Brown
0.2°	-4°	70	50	25	9.0	14	4.0	1.0
0.2°	+30°	30	22	7.0	3.5	6.0	1.7	0.3
0.5°	-4°	30	25	13	4.5	7.5	2.0	0.3
0.5°	+30°	15	13	4.0	2.2	3.0	0.8	0.2

(Source: ASTM D 4956)

At the end of 5 years, the sheeting shall retain at least 50 percent of the retro-reflectance values given in **Table 6.3.**

6.7.2.2 Type II Super Engineering Grade Sheeting

This sheeting shall be of enclosed lens glass bead type consisting of microscopic lens elements or microprismatic retroreflective elements. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum coefficient of retro-reflection (determined in accordance with ASTM D 4956) as indicated in **Table 6.4.**

Table 6.4 Acceptable Minimum Coefficient of Retro-Reflection for Type II Super Engineering Grade Sheeting (Candela per Lux per Square Metre)

Observation Angle	Entrance Angle	White	Yellow	Orange	Green	Red	Blue	Brown
0.2°	-4°	140	100	60	30	30	10	5
0.2°	+30°	60	36	22	10	12	4	2
0.5°	-4°	50	33	20	9	10	3	2
0.5°	+30°	28	20	12	6	6	2	1

(Source: ASTM D 4956)

At the end of 5 years, the sheeting shall retain at least 50 percent of the retro-reflectance values given in **Table 6.4.**

6.7.3 *Class B (High Intensity Grade Sheeting)*

6.7.3.1 Type III High Intensity Grade

This high intensity retro-reflective sheeting shall be of encapsulated lens type consisting of spherical glass lens, elements or microprismatic retroreflective elements. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection (determined in accordance with ASTM D 4956) as indicated in **Table 6.5**.

At the end of 7 years, the sheeting shall retain at least 80 percent of the retro-reflectance values given in **Table 6.5.**

Table 6.5 Acceptable Minimum Coefficient of Retro-Reflection for Type III High Intensity Grade Sheeting[A] (Candela per Lux per Square Metre)

Observation Angle	Entrance Angle	White	Yellow	Orange	Green	Red	Blue	Brown
0.1°[B]	-4°	300	200	120	54	54	24	14
0.1°[B]	+30°	180	120	72	32	32	14	10
0.2°	-4°	250	170	100	45	45	20	12
0.2°	+30°	150	100	60	25	25	11	8.5
0.5°	-4°	95	62	30	15	15	7.5	5.0
0.5°	+30°	65	45	25	10	10	5.0	3.5

A Minimum Coefficient of Retro reflection (R_A) ($cd.lx^{-1}.m^{-2}$).(Source: ASTM D 4956)

B Values for 0.1° observation angles are supplementary requirements that shall apply only when specified by the purchaser in the contract or order.

6.7.3.2 Type IV High Intensity Micro-Prismatic Grade Sheeting (HIP)

This sheeting shall be of high intensity retro-reflective sheeting made of micro-prismatic retro-reflective element material coated with pressure sensitive adhesive. The retro-reflective surface after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection (determined in accordance with ASTM D 4956) as indicated in **Table 6.6.**

At the end of 7 years, the sheeting shall retain at least 80 percent of the retro-reflectance values given in **Table 6.6.**

Table 6.6 Acceptable Minimum Coefficient of Retro-Reflection for Type IV High Intensity Micro-Prismatic Grade Sheeting[A] (Candela per Lux per Square Metre)

Observation Angle	Entrance Angle	White	Yellow	Orange	Green	Red	Blue	Brown
-0.1°[B]	-4°	500	380	200	70	90	42	25
0.1°[B]	+30°	240	175	94	32	42	20	12
0.2°	-4°	360	270	145	50	65	30	18
0.2°	+30°	170	135	68	25	30	14	8.5
0.5°	-4°	150	110	60	21	27	13	7.5
0.5°	+30°	72	54	28	10	13	6	3.5

A *Minimum Coefficient of Retro-reflection (R_A)(cd.lx^{-1}.m^{-2}). (Source: ASTM D 4956)*

B *Values for 0.1° observation angles are supplementary requirements that shall apply only when specified by the purchaser in the contract or order.*

6.7.4 *Class C (Micro Prismatic Grade Sheeting)*

6.7.4.1 Type VIII Micro Prismatic Grade Sheeting

Retro-reflective sheeting is typically manufactured as a cube corner. The reflective sheeting shall be retro-reflective sheeting made of micro prismatic retro-reflective material. The retro-reflective surface, after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection (determined in accordance with ASTM D 4956) as indicated in **Table 6.7.**

At the end of 10 years, the sheeting used shall retain at least 80 percent of the retro-reflectance values presented in **Table 6.7.**

6.7.4.2 Type IX Micro Prismatic Grade Sheeting

Retro-reflective sheeting is typically manufactured as a cube corner. The reflective sheeting shall be retro-reflective sheeting made of micro prismatic retro-reflective material. The retro-reflective surface, after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection (determined in accordance with ASTM D 4956) as indicated in **Table 6.8.**

At the end of 10 years, the sheeting shall retain at least 80 percent of the retro-reflectance values given in **Table 6.8.**

Table 6.7 Acceptable Minimum Coefficient of Retro-Reflection for Type VIII Prismatic Grade Sheeting[A] (Candela per Lux per Square Metre)

Observation Angle	Entrance Angle	White	Yellow	Orange	Green	Red	Blue	Brown	Fluorescent Yellow -Green	Fluorescent Yellow	Fluorescent Orang
0.1°[B]	-4°	1000	750	375	100	150	45	30	800	600	300
0.1°[B]	+30°	460	345	175	46	69	21	14	370	280	135
0.2°	-4°	700	525	265	70	105	32	21	560	420	210
0.2°	+30°	325	245	120	33	49	15	10	260	200	95
0.5°	-4°	250	190	94	25	38	11	7.5	200	150	75
0.5°	+30°	115	86	43	12	17	5	3.5	92	69	35

A *Minimum Co-efficient of Retro-reflection (R_A) (cd.lx^{-1}.m^{-2}). (Source: ASTM D 4956)*

B *Values for 0.1° observation angles are supplementary requirements that shall apply only when specified by the purchaser in the contract or order.*

Table 6.8 Acceptable Minimum Coefficient of Retro-Reflection for Type IX Prismatic Grade Sheeting[A] (Candela Per Lux Per Square Metre)

Observation Angle	Entrance Angle	White	Yellow	Orange	Green	Red	Blue	Fluorescent Yellow-Green	Fluorescent Yellow	Fluorescent Orange
0.1°[B]	-4°	660	500	250	66	130	30	530	400	200
0.1°[B]	+30°	370	280	140	37	74	17	300	220	110
0.2°	-4°	380	285	145	38	76	17	300	230	115
0.2°	+30°	215	162	82	22	43	10	170	130	65
0.5°	-4°	240	180	90	24	48	11	190	145	72
0.5°	+30°	135	100	50	14	27	6	110	81	41
1.0°	-4°	80	60	30	8	16	3.6	64	48	24
1.0°	+30°	45	34	17	4.5	9.0	2	36	27	14

A *Minimum Coefficient of Retro-Reflection (R_A) ($cd.lx^{-1}.m^{-2}$). (Source: ASTM D 4956)*

B *Values for 0.1° observation angles are supplementary requirements that shall apply only when specified by the purchaser in the contract or order.*

6.7.4.3 Type XI Micro Prismatic Grade Sheeting

Retro-reflective sheeting is typically manufactured using a full cube corner technology. The reflective sheeting shall be retro-reflective sheeting made of micro prismatic retro-reflective material. The retro-reflective surface, after cleaning with soap and water and in dry condition shall have the minimum co-efficient of retro-reflection (determined in accordance with ASTM D 4956) as indicated in **Table 6.9.**

Table 6.9 Acceptable Minimum Coefficient of Retro-Reflection for Type XI Prismatic Grade Sheeting[A] (Candela per Lux per Square Metre)

Observation Angle	Entrance Angle	White	Yellow	Orange	Green	Red	Blue	Brown	Florescent Yellow-Green	Florescent Yellow	Florescent Orange
0.1°[B]	-4°	830	620	290	83	125	37	25	660	500	250
0.1°[B]	+30°	325	245	115	33	50	15	10	260	200	100
0.2°	-4°	580	435	200	58	87	26	17	460	350	175
0.2°	+30°	220	165	77	22	33	10	7	180	130	66
0.5°	-4°	420	315	150	42	63	19	13	340	250	125
0.5°	+30°	150	110	53	15	23	7	5	120	90	45
1.0°	-4°	120	90	42	12	18	5	4	96	72	36
1.0°	+30°	45	34	16	5	7	2	1	36	27	14

A *Minimum Coefficient of Retro-reflection (R_A) ($cd.lx^{-1}.m^{-2}$). (Source: ASTM D 4956)*

B *Values for 0.1° observation angles are supplementary requirements that shall apply only when specified by the purchaser in the contract or order.*

At the end of 10 years, the sheeting shall retain at least 80 percent of the retro-reflectance value given in **Table 6.9.**

6.7.5 *Adhesives*

The sheeting shall have a pressure-sensitive adhesive of the aggressive-tack type requiring no heat, solvent or other preparation for adhesion to a smooth clean surface, in a manner recommended by the sheeting manufacturer. The adhesive shall be protected by an easily removable liner (removable by peeling without soaking in water or other solvent) and shall be suitable for the type of material of the base plate used for the sign. The adhesive shall form a durable bond to smooth, corrosion and weather resistant surface of the base plate such that it shall not be possible to remove the sheeting from the sign base in one piece by use of sharp instrument. The sheeting shall be applied in accordance with the manufacturer's specifications.

6.7.6 *Fabrication*

Surface to be reflectorized shall be effectively prepared to receive the retro-reflective sheeting. The aluminum sheeting shall be de-greased either by acid or hot alkaline etching and all scale/ dust removed to obtain a smooth plain surface before the application of retro-reflective sheeting. If the surface is rough, approved surface primer may be used. After cleaning, metal shall not be handled, except by suitable device or clean canvas gloves, between all cleaning and preparation operation and application of reflective sheeting/primer. There shall be no opportunity for metal to come in contact with grease, oil or other contaminants prior to the application of retro-reflective sheeting. Complete sheets of the material shall be used on the signs except where it is unavoidable. Signs with a side dimension up to 1200 mm shall not have any joints (splices) in the base retro reflective sheeting and in the substrate. At splices, sheeting with pressure-sensitive adhesives shall be overlapped not less than 5 mm. Where screen printing with transparent colours is proposed, only butt joint shall be used. The material shall cover the sign surface evenly and shall be free from twists, cracks and folds. Cut-outs to produce legends and borders shall be bonded with the sheeting in the manner specified by the manufacturer.

6.8 Messages/Borders

The messages (legends, letters, numerals, etc.) and borders shall either be screen-printed or cut out from durable transparent overlay or cut-out from the same type of reflective sheeting or digitally printed for the cautionary and mandatory sign boards on top of the base retro reflective sheeting which should be covering the entire sign facia (end to end) of the substrate. Either screen printing or digitally printing shall be processed and finished with materials in a manner specified by the sheeting manufacturer. In the case of informatory sign boards (including tourism related sign boards), the messages (legends, letters, numerals etc.) and borders shall be cut-out from durable transparent overlay film or cut-out from the same reflective sheeting or digitally

printed. Such cut-outs shall be made from durable transparent overlay materials as specified by the sheeting manufacturer and shall be bonded with the sheeting in the manner specified by the manufacturer. Whenever transparent overlay film is used for making any type of sign, the coloured portion of sign shall have coefficient of reflectivity not less than the reflectivity of type and colour of sheeting normally used which are given in **Tables 6.3 to 6.9**. Cut-out messages and borders, wherever used, shall be either made out of retro-reflective sheeting or made out of durable transparent overlay except those in black which shall be of opaque in the case of durable transparent overlay.

In the case of screen printed transparent coloured areas on white sheeting, the coefficient of retro reflection shall not be less than 50 percent of the values of corresponding colour given in **Tables 6.3 to 6.9.** In the case of digital printing, the signs shall be manufactured using a system of matched components of reflective sheeting and overlay films and digital inks manufactured and supplied by the reflective sheeting manufacturer. The digital printer and digital ink shall be approved by the reflective sheeting manufacture. Digitally printed traffic colour (red, blue, green, yellow, orange and brown) areas on white sheeting shall not be having less than 70 percent of the value of the coefficient of retro reflection established for its colour and type of sheeting as given in **Table 6.3 to 6.9.**

Initial colour shall meet the daytime and nighttime colour limits as defined in the effective version of ASTM D 4956. Printed traffic colours shall also meet the accelerated outdoor weathering and colour fastness requirements as per ASTM D 4956. Digitally printed black copy shall remain sufficiently opaque for its intended use for the warranty period of the base sheeting. Digitally printing of custom colours shall have documented sheeting manufacturer warranty, stating that custom colours do not excessively fade, discolour, crack, craze, peel, blister or lose reflectivity such that the signs become functionally unsuitable for their intended purpose during the warranty period of the base sheet. Finished signs shall have an Ultra Violet (UV) protective clear overlay applied to the entire face of the sign supplied by the reflective sheeting manufacturer. Overlay and digital inks shall be part of a matched component system as recommended by the retro-reflective sheeting manufacturer. Completed printed surface shall be free of bubbles, blemishes, streaks or spotted areas. In the case of Chevron Signs and Object Hazard Markers, full sign facia shall be covered with retro reflective sheeting and the patterns shall be made with either black overlay film or screen printing or digital printing.

6.9 Warranty and Durability

The Contractor shall obtain from the manufacturer of the reflective sheeting a ten year warranty for satisfactory field performance including stipulated retro-reflectance of the retro-reflective sheeting for micro-prismatic Class C grade sheeting, seven years for Class B grade sheeting, five years for Class A grade sheeting and submit the same to the Engineer in charge. The warranty shall be inclusive of the screen printed or cut out letters/legends and their bonding to the retro-reflective sheeting. Warranty document shall be in original having a unique number with date and shall be addressed to the engineer in charge with the project details including details of the sign boards installed. Warranty issued by any party other than the sheeting manufacturer

shall not be accepted. Contractor/supplier should furnish the lot numbers and certification that the signs and materials supplied against the assigned work meets all the stipulated requirements and carry the stipulated warranty and that the contractor/supplier is the authorized converter of the particular sheeting. As a part of source approval (to assure the quality of product prior to supply), contractor shall obtain from the manufacturer of sheeting a prequalification warranty certificate stating that the material they are offering will have the warranty as mentioned above and the certificate shall be submitted to the Engineer in charge. In the case of digitally printed sign boards, the coefficient of retro reflection after the stipulated warranty period shall be minimum 80 percent of the initial value of the printed sign as per Clause 6.8. Match component system warranty for the components like retro-reflective sheeting, overlay films and digital inks shall be provided by the manufacturer.

7. POSTS AND MOUNTINGS FOR SIGNS

7.1 The traffic signs shall be mounted on support posts, which shall be made of either Mild Steel (MS) or Galvanized Iron (GI) pipes conforming to IS 1239, Circular Hollow Section conforming to IS 1161, Rectangular Hollow Section conforming to IS 4923 or Square Hollow Section conforming to IS 3589. In the case of signs supported on two or more posts, if necessary, bracing may also be provided. Sign posts, their foundations and sign mountings shall be so constructed as to hold these in a proper and permanent position against the normal storm wind loads or displacement by vandalism. Normally, signs with an area up to 0.9 square metre shall be mounted on a single post, and for greater area, two or more supports shall be provided. Sign post/support end(s) shall be firmly fixed to the ground by means of properly designed concrete foundation. The work of foundation shall conform to relevant specifications.

7.2 All components of signs and supports including all nuts and bolts, other than the reflective portion of GI posts shall be thoroughly descaled, cleaned, primed and painted with two coats of epoxy paint or powder coating. Any part of mild steel (MS) post below ground shall be painted with three coats of redoxide paint.

7.3 Except in the case of railway level crossing signs (for which the colour scheme is given in Section 15.71) the sign posts shall be painted in 250 mm wide bands, alternately black and white. The lowest band next to the ground shall be in black.

7.4 The signs shall be fixed to the posts by welding in the case of steel posts and by bolts and washers of suitable size in the case of reinforced concrete or GI posts. After the nuts have been tightened, the tails of the bolts shall be furred over with a hammer to prevent removal.

7.5 For overhead signs, the support system should be properly designed based on sound engineering principles, to safely sustain the dead load, live load and wind load on the completed sign system. For this purpose, the overhead signs shall be designed to withstand a wind loading of 150 kg/m^2 normal to the face of the sign and 30 kg/m^2 transverse to the face of the sign. In addition to the dead load of the structure, walkway loading of 250 kg concentrated live load shall also be considered for the design of the overhead sign structure.

8. COLOUR FOR SIGNS

8.1 Signs shall be provided with retro-reflective sheeting and/or overlay film as shown on the detailed drawings. The reverse side of all signs shall be painted grey.

8.2 The colour of the material shall be located within the area defined by the chromaticity coordinates in **Table 8.1** and comply with the luminance factor given in **Table 8.2** when measured as per ASTM D 4956. Chromaticity is the objective specification of the quality of a colour regardless of its luminance, that is, as determined by its hue and colourfulness (or saturation, chroma, or intensity)

8.3 The colours shall be durable and uniform in acceptable hue when viewed in day light or under normal headlights at night.

8.4 The mandatory and warning signs shall be provided with white background and red border. The legend/symbol for these signs shall be in black.

8.5 Colour pattern for direction information signs is given in **Table 8.3.**

The colours chosen for informatory or guide signs shall be distinct for different categories of roads. For various categories of road in India, following colour pattern shall be used for direction information sign as given in **Table 8.3.**

Table 8.1 Chromaticity Coordinates for Different Colours

(a) Colour Specification Limits (Daytime)[A]

Colour	1		2		3		4	
	x	y	x	y	x	y	x	y
White	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329
Yellow	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.472
Green[B]	0.026	0.399	0.166	0.364	0.286	0.446	0.207	0.771
Red	0.648	0.351	0.735	0.265	0.629	0.281	0.565	0.346
Blue[B]	0.140	0.035	0.244	0.210	0.190	0.255	0.065	0.216
Orange	0.558	0.352	0.636	0.364	0.570	0.429	0.506	0.404
Brown	0.430	0.340	0.610	0.390	0.550	0.450	0.430	0.390
Fluorescent Yellow-Green	0.387	0.610	0.369	0.546	0.428	0.496	0.460	0.540
Fluorescent Yellow	0.479	0.520	0.446	0.483	0.512	0.421	0.557	0.442
Fluorescent Orange	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355

A *The four pairs of chromaticity coordinates determine the acceptable colour in terms of the CIE 1931 Standard Colorimetric System measured with CIE Standard Illuminant D65.*

B *The saturation limit of green and blue may extend to the border of the CIE chromaticity locus for spectral colours.*

(b) Colour Specification Limits (Nighttime)[A]

Colour	1		2		3		4	
	x	y	x	y	x	y	x	y
White	0.475	0.452	0.36	0.415	0.392	0.37	0.515	0.409
Yellow	0.513	0.487	0.5	0.47	0.545	0.425	0.572	0.425
Orange	0.595	0.405	0.565	0.405	0.613	0.355	0.643	0.355
Green	0.007	0.57	0.2	0.5	0.322	0.59	0.193	0.782
Red	0.65	0.348	0.62	0.348	0.712	0.255	0.735	0.265
Blue	0.091	0.133	0.23	0.24	0.18	0.37	0.033	0.37
Purple	0.355	0.088	0.635	0.221	0.5	0.35	0.385	0.288
Brown	0.595	0.405	0.54	0.405	0.57	0.365	0.643	0.355
Fluorescent-Yellow-Green	0.48	0.52	0.473	0.49	0.523	0.44	0.55	0.449
Fluorescent-Yellow	0.554	0.445	0.526	0.437	0.569	0.394	0.61	0.39
Fluorescent-Orange	0.625	0.375	0.589	0.376	0.636	0.33	0.669	0.331

A The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE1931 Standard Colorimetric System measured with CIE Standard Illuminant

Table 8.2 Daytime Luminance Factor (Y%)

Colour	Non Metallic Portion		Metallic Portion*	
	Min	Max	Min	Max
White	27	--	15	--
Yellow	15	45	12	30
Green	3.0	12	2.5	11
Red	2.5	15	2.5	11
Blue	1.0	10	1.0	10
Orange	10	30	7.0	25
Brown	1.0	9.0	1.0	9.0
Fluorescent Yellow-Green	60	--	--	--
Fluorescent Yellow	40	--	--	--
Fluorescent Orange	20	--	--	--

**Performance defined for the metallic portion is applicable only to Type V grade retro reflective sheeting as per ASTM D 4956*

Table 8.3 Colour Pattern for Direction Information Signs

Road Type	Background	Arrows/Border/Letters
Expressway	Blue	White
National Highway (NH)	Green	White
State Highway (SH)	Green	White
Major District Road (MDR)	Green	White
Village Road (ODR and VR)	White	Black

Urban/City Road	Blue	White
Other Scenario		
Tourism related Signs	Brown	White
Temporary/Work zone Signs	Yellow	Black

9. SIZE OF SIGNS

9.1 As a general rule, there shall be four sizes (600 mm, 750 mm, 900 mm and 1200 mm) of signs for mandatory/regulatory and cautionary/warning signs. In the case of Expressways having design speed in excess of 120 Kmph, sign size of 1500 mm shall be used for the cautionary and regulatory signs. For certain categories of mandatory/regulatory signs, smaller diameter of 300 mm boards can be used in conjunction with traffic light signals or on bollards on traffic islands.

9.2 General dimensions of different categories of signs are given in the respective sections.

10. DEFINITION PLATES/SUPPLEMENTARY PLATES

10.1 Where the competent authority considers it advisable to make the meaning of a sign or symbol more explicit, or in the case of mandatory signs to limit their application to certain categories of road users or to specific periods, an inscription shall be placed below the sign in a rectangular definition plate of suitable size. The definition plate shall be with retro-reflective white background and black letters and black border. Numerals shall be inscribed in international form of Indian numerals and word messages shall be in English and/or other languages as necessary. To contain the size of the sign, the number of languages on the signs shall normally be limited to two. An example of definition plate with design elements is given in **Plate-III (Fig. 16.17).**

11. VISIBILITY OF SIGNS

11.1 In order to make signs more visible and legible at night, in particular cautionary/warning signs and regulatory signs shall be provided with reflective sheeting. Care should, however, be taken that this does not result in road users becoming dazzled.

11.2 It is essential that drivers and other road users have an unobstructed view of road signs. The distance which should be kept clear of obstructions to the sight line, whether caused by vegetation (e.g. bushes, trees), other signs or street furniture (e.g. crash barriers), is known as the clear visibility distance. The higher the prevailing traffic speeds, the greater this distance needs to be.

11.3 Backing Board and Use of Fluorescent Colour for Pedestrian Crossing

11.3.1 *Design*

To improve conspicuity against a complex or dark background, a sign may be mounted on a yellow backing board as shown in **Fig. 11.1**. A backing board can also be used for a neater assembly, e.g. when a sign requires a supplementary plate, and also eliminates the risk of

the plate becoming misaligned. A yellow backing board must be rectangular or square in shape. A backing board must not itself be provided with a border, nor give the impression of being an additional border.

There are potential disadvantages to the use of backing boards. The larger overall size of the assembly can sometimes obstruct sight lines. A backing board can deprive triangular signs of a primary recognition aid and their distinctive silhouette. Yellow backing boards are environmentally intrusive, and their over-use could eventually devalue their attention-attracting benefits. A less garish way of increasing a sign's conspicuity is simply to provide a standard sign of larger size. Not only will this be more noticeable than a smaller sign, but it will also improve legibility and hence reading distance, which a yellow backing board cannot.

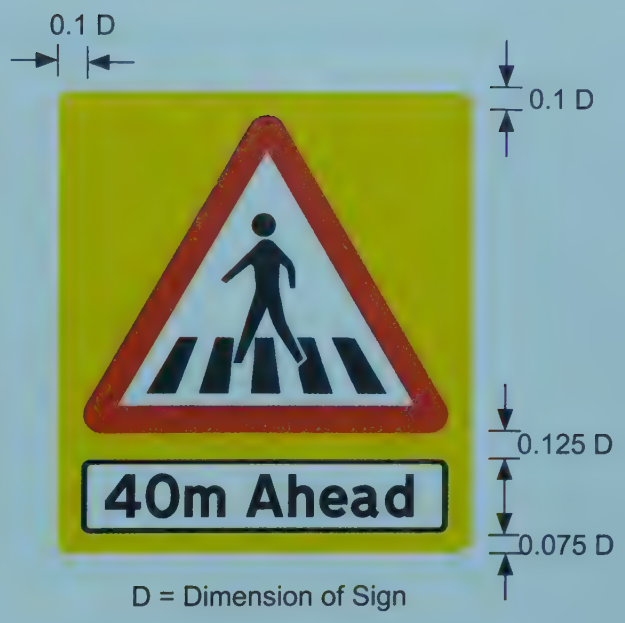


Fig. 11.1 Backing Board with Fluorescent Yellow Colour for Pedestrian Crossing

11.3.2 *Warrants for Using Backing Boards*

When all other normal treatments have been tried (e.g. larger signs and upgraded delineation) and still a higher-than-expected crash rate is experienced, only then should the use of a yellow backing board be considered. They should be used very sparingly as a special case and not as a matter of routine. It may also be fluorescent; this greatly increases conspicuity in dull weather and at dusk. Fluorescence can be particularly effective in drawing attention to signs mounted in deep shadow, e.g. below overhanging trees or in places affected by dull or foggy weather conditions. In summary, yellow backing board or fluorescence are somewhat visually intrusive and hence should be used with discretion.

12. SIZE OF LETTERS

12.1 Letter size should be chosen considering the design speed, classification and sign location on the road, so that the sign is of adequate size for legibility but without being too large or obtrusive. The size of the letter, in terms of x-height, to be chosen as per the design speed (considering Legibility Index of 45) is given in **Table 12.1.**

12.2 Letter size on definition plates attached with signs with dimension greater than or equal to 900 mm should be 50 mm or 100 mm, and in the case of signs with dimensions less than 900 mm, it should be 50 mm. Where the message is long, the message may be broken into two lines and the size of letters may be varied in the lines so that the definition plate is not too large. The lettering on definition plates will be all in upper case letters for all types of regulatory signs and follow sentence case format for cautionary and informatory signs. Example for Definition Plate is given in **Plate-III (Fig. 16.17).**

Table 12.1 Letter Size and Siting of Information Signs (Shoulder & Overhead Mounted)#

Design Speed (Kmph)	Advance Direction Signs (Shoulder Mounted)					Flag Type Direction Signs Reassurance Signs Place Identification Signs			Overhead Direction Signs		
	"x" height (mm) lower case	"X" height (mm) upper case	Minimum clear visibility to the sign (m)	ONE Sign: Distance from junction (m)	TWO Signs: Distance between 1st and 2nd sign (m)	"x" height (mm) lower case	"X" height (mm) upper case	Minimum clear visibility to the sign (m)	"x" height (mm) lower case	"X" height (mm) upper case	Minimum clear visibility to the sign (m)
1	2	3	4	5	6	7	8	9	10	11	12
Up to 30	70	100	55	20	Nil	55	75	35	210	290	155
31 - 50	100	140	75	45	45	80	110	55			
51 - 65	125	175	95	90	50	100	140	65			
66 - 80	175	245	130	90 - 150	70	140	195	95			
81 - 100	215	300	160	150 - 225	100	170	240	115	250	350	190
101 - 120	305	425	230	225 - 300 See Note 1	100 See Note 1	245	345	165	330	460	250
121 - 150	340	475	255	See Note 1	See Note 1	270	380	180	380	530	285

Note: Where there are site/space constraints, 80 percent of the values shall be adopted for x height

*#Derived from the first principle presented in **Annexure VI***

Notes:

1. For grade separated junction, two or three advance direction signs are to be provided. These shall be located at the start of diverging lane, 250 m to 750 m from the exit and additionally 750 m to 1500 m from the exit.
2. The "x" height is the height of a lower case English "Transport Medium" font and upper case shall be 1.4 times of lower case height.
3. In columns 2, 3, 7, 8, 10 and 11 of **Table 12.1** the font heights shown are normal size to be used for respective design speeds. The font size can be increased by another 20 percent from the normal font size for those direction boards requiring special emphasis/attention.
4. In columns 4 and 9 of **Table 12.1,** the clear visibility distances indicated are minimum values. Greater distances should be provided wherever possible.
5. In columns 5 and 6 of **Table 12.1,** the distances shown are for guidance only and are not to be taken precise.
6. Reassurance Signs shall normally be placed about 100-150 m after the junction. Place Identification Signs are normally placed about 90 m to 150 m in advance of the start of the built-up area and flag type direction signs are generally installed at the nose of diverging lanes. If reassurance signs mounted on overhead boards, overhead sign font sizes (col. 10, 11) should be followed.
7. Columns 10, 11 and 12 of **Table 12.1** shall be taken for design of overhead signs.

13. MAINTENANCE OF SIGNS

13.1 Prior to installing any road sign, the responsibility for the maintenance of the sign and the post is required to be decided, and the timing plan(s) should be clearly established. Over time, signs become faded and their retro-reflective properties diminish. This reduces both conspicuity and legibility, by day and by night. Excessively discoloured or faded signs (e.g. white backgrounds which have become grey or brown, or red borders faded to pink) and where the legend or graphic is peeling off cannot be fully effective and need to be replaced immediately. The signs along with the posts shall be maintained in proper position, and kept clean and legible at all times. Signs should be cleaned at intervals appropriate to the site conditions. Signs at locations where they are subject to heavy soiling from passing traffic, or algae growth (a common problem with signs beneath tree canopies) will need more frequent cleaning.

13.2 A reference number along with the type of sheeting, Manufacturer name, month and year of installation should be placed on the back of a sign in a contrasting colour or by indelible marking in characters not exceeding 50 mm in height. Additionally, a 2D Bar code (Quick Response (QR) Code) should be placed on the back side of the sign board with an indelible ink. The details like type of sheeting, manufacturer name, month and year of installation, project details etc. can be fed into this bar code. The size of such bar codes shall be restricted to 2 * 2 inches *i.e.* 51 mm * 51 mm and placed at the bottom (either left or right) depending on the location and type of sign. A typical format is given in **Annexure-VII.**

13.3 All signs shall be visually inspected at least twice a year both in day and night times and at least once a year in the rain. Performance of all the signs should be evaluated with retro reflectometer at an interval of every two years. All signs should be replaced either at the end of warranty period of the retro-reflective sheeting used on the sign or if the reflectivity of the sheet goes below 80 percent of the initial reflectivity given in **Table 6.3 to 6.9**. Damaged signs shall be replaced immediately. Recording format for periodic testing of retro reflectivity is mentioned in **Annexure-VIII.**

13.4 The authorities responsible for the road signs should maintain a schedule of painting of the posts and non-reflective area of signs periodically. It is recommended that painting of the signs (where applicable) may be undertaken after every two years. In case of overhead signs, adequate provision is to be made to have access to the signs for the purpose of maintenance activities. This must be ensured at the time of installation. Special care shall be taken to see that weeds, shrubbery, mud, etc. are not allowed to obscure any sign.

13.5 In addition to the painting of the posts of shoulder mounted sign boards, alternate white and yellow bands measuring 50 mm long retro-reflective sheeting shall be pasted around them which would help in ensuring the visibility/presence of poles during nighttime even if the sign boards are stolen or totally vandalized. Three to four bands of such retro-reflective sheeting shall be pasted starting from a height of 0.5 m above the ground level.

14. MANDATORY/REGULATORY SIGNS

14.1 The detailed dimensioned drawings of 900 mm sized sign and symbols thereon are shown in **Plate-I** for ease of reproduction. For signs of other sizes, the symbols should be proportionately reduced or enlarged. The mandatory/regulatory signs are listed in **Annexure-I.** These are classified under the following sub-heads keeping in view their design and application:

(i) "STOP" and "GIVE WAY" signs (Right of way signs)

(ii) "Prohibitory" signs

(iii) "No Parking" and "No Stopping" signs

(iv) "Speed Limit" and "Vehicle Control" signs

(v) "Restriction Ends" sign, and

(vi) "Compulsory Direction Control" and other signs

14.2 Regulatory signs that indicate the beginning of a restriction or prohibition and to which direction it applies have to be placed in accordance with that direction. The requirement is that the signs must be placed on each side of the road or on each side of the appropriate carriageway of a dual carriageway road; excepting that, signs need to be placed only on one side if any of the following circumstances apply:

(i) Where the restriction, requirement or prohibition applies only to one side of the road.

(ii) At a junction where traffic turns from a one-way road into the relevant road. The sign should be angled to face towards the driver.

(iii) At a junction where the carriageway of the relevant road is less than 5 m wide and the centre of the sign is no more than 2 m from the edge of the carriageway.

14.3 Mandatory and regulatory signs are normally sited at or near the point where the instruction applies. **Table 12.1** (Column 4) specifies minimum clear visibility distances for regulatory and mandatory signs. These should normally be measured from the center of most disadvantaged driving lanes. The more the number of signs which drivers are presented with simultaneously, the greater the difficulty they are likely to have in assimilating the information. Generally, not more than two signs should be erected on any one post when intended to be read from an approaching vehicle and this applies when signs are mounted at the same location on separate posts. Terminal speed limit signs should be mounted alone. When a sign needs supplementary plate, the combination of sign and plate may be regarded as one sign.

14.4 STOP Sign

14.4.1 *Purpose*

This is for indicating priority for the right of way. The sign is intended for use only on the Minor Road intersecting with Major Road where traffic is required to stop before entering a major road. It is intended to communicate through this sign that the vehicle shall proceed past the stop line only after ascertaining that this will not cause danger to traffic on the main road. This is a Mandatory/Regulatory sign **(Fig. 14.01).**

14.4.2 *Combination with Markings*

The stop sign shall always be used in combination with certain road markings, such as stop line and the word "STOP" marked on the pavement vide IRC:35 "Code of Practice for Road Markings".

14.4.3 *Size, Shape and Colour*

The sign (shown in **Fig. 14.01**) shall be octagonal in shape and shall have red background and white border. The word "STOP" shall be written in white (in English or local language) and centrally positioned. The height of the octagon and border shall be as per **Table 14.1.**

Table 14.1 Sizes and Dimensions of 'STOP' Sign

Approach Speed on Minor Road	Height (mm)	Border (mm)	Font Size (mm)-Capital Letter
Upto 50 Kmph	750	25	175
51 - 65 Kmph	900	30	210
> 65 Kmph	1200	40	280

14.4.4 *Warrants for Installation*

The sign should be used on a minor road at its intersection with a major road where conditions are considered to be unduly hazardous due to restricted visibility, bad alignment and high crash records. Generally, if the visibility funnel as shown in **Fig.14.1** is not obstruction free, stop sign shall be installed. The visibility funnel for varying scenarios is presented in **Table 14.2.**

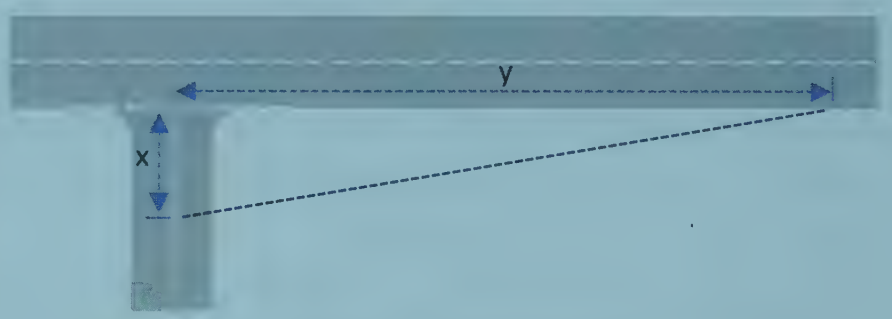


Fig. 14.1 Description of Visibility Funnel

Table 14.2 Distances in Visibility Funnel under Different Speeds on Major Road

Speed on Major Road	Visibility Distances on Major Road(y in metre)	Distance measured along the center line of minor road from edge line of major road (x in metre)
Up to 15 Kmph	15	x = 4.5 m for medium traffic = 3.0 m for light traffic.
31 - 50 Kmph	30	
51 - 65 Kmph	45	
66 - 80 Kmph	70	
81 - 100 Kmph	90	
> 100 Kmph	120	

Note:

(1) The visibility distance (y) is measured along the nearer edge of the major road from a point 1.05 m above the central line of the minor road (representing the driver's eye position.)

(2) x = 3 m for side roads with light traffic measured from the edge of the major road carriage way along the center line of the minor road, and 4.5 m when minor road has medium traffic volume.

14.4.5 *Location*

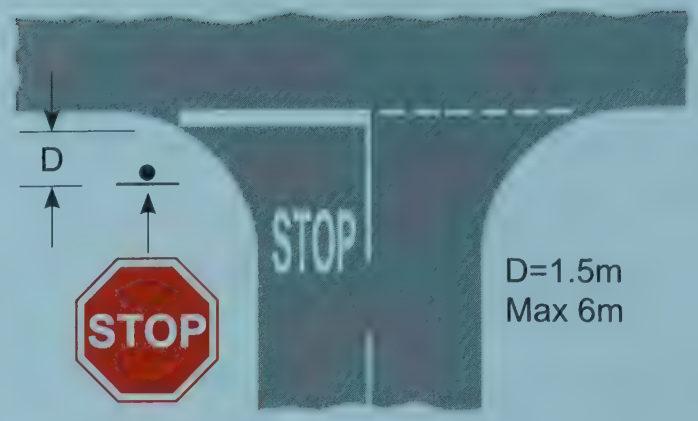


Fig. 14.2 Location Description of STOP Sign

The sign shall be installed on the left side of the approach to which it applies. Stop signs should be sited as close to the stop line as possible but not in such a position as to impair visibility along the major road. Normally, these should be fixed 1.5 m in advance of the stop line. If the site conditions prevent a sign so placed from being easily seen, it should be placed at a greater distance in advance of the STOP line, but in no case more than 6 m as shown in **Fig. 14.2**. When the STOP sign is installed at the required location and the sign visibility is restricted, a Stop Ahead sign shall be installed in advance of the STOP sign. STOP sign has to be a standalone sign when used. The sign shall not be used at intersection where traffic signals are installed.

14.5 GIVE WAY Sign

14.5.1 *Purpose*

GIVE WAY sign shall be used to assign right-of-way to traffic on certain roadways at intersections i.e. roundabouts/rotary, the intention being that the vehicles controlled by the sign must give way i.e. yield to other traffic having the right of way. Vehicles controlled by this sign need to slow down or stop when necessary to avoid interfering with conflicting traffic. This is a Mandatory/ Regulatory sign **(Fig. 14.02).**

14.5.2 *Size, Shape and Colour*

The sign shall be an equilateral triangle with the apex downwards. It shall have red border and white background. The sizes and dimensions of these signs shall be as prescribed in **Table 14.3.**

Table 14.3 Sizes and Dimensions of 'GIVE WAY' Sign

Approach Speed on Minor Road	Side (mm)	Border (mm)
Up to 50 Kmph	600	45
51 - 80 Kmph	900	70
> 80 Kmph	1200	90

14.5.3 *Warrants for Installation*

The sign shall be used on all the approach arms of the roundabout/rotary where it is necessary to assign right-of-way to the circulating traffic at the intersection wherein a stop is not necessary at all times for the entering traffic which need to yield. Further, the sign shall also be used on hill roads with single or intermediate lane carriageway on long gradients facing the downhill traffic to assign right-of-way to vehicles climbing uphill. The visibility funnel shown in **Fig. 14.1** shall be obstruction free while installing a Give Way sign. Moreover, GIVE WAY sign together with its associated road markings can be installed at the following instances:

i) In non-urban areas at all junctions having equal priority on all approaches (like National Highway meeting National Highway or State Highway meeting a State Highway)

ii) In urban areas generally at junctions of minor road with trunk and principal road. However, if the minor road is a residential or local street, it is advisable to provide a STOP sign instead of Give Way Sign considering the poor adherence to critical gap phenomenon by the motorists on Indian roads.

14.5.4 *Location*

The sign shall be located in advance to the point where vehicles are required to stop or to slow down to yield the right-of-way, say at a distance of 1.5 m to 12 m (maximum distance of 12 m is applicable for roundabouts / rotary). It is also recommended that Give Way line (Ref. IRC:35) at the entry to the junction. Give Way line may be preceded by GIVE WAY marking on the road as shown in **Fig. 14.3**. On gradients, the sign should be placed at the start of the down gradient and repeated as necessary.

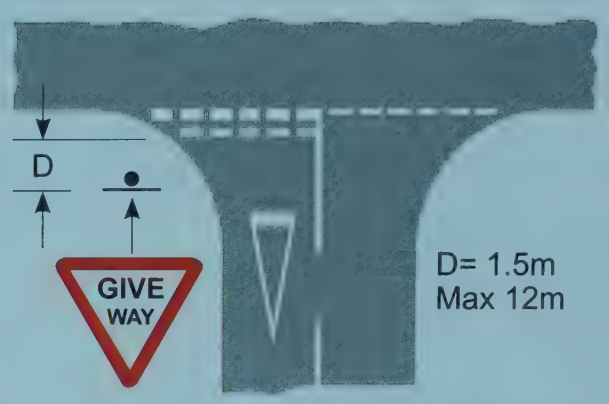


Fig. 14.3 Location Description of GIVE WAY Sign

14.5.5 *Give Way to Buses Exiting Bus Lay-by Ahead*

The sign shall be used to inform about Give Way to Buses exiting from a bus lay-by ahead. The sign shall be placed at the beginning of such area **(Fig. 14.03).**

14.6 Prohibitory Signs

These signs generally give instructions regarding maneuver that must not be made. Prohibitory signs indicate a forbidden maneuver. They cover both junctions and the sections of road between junctions.

14.6.1 *Size, Shape and Colour*

The signs shall be of circular shape with a red border having red oblique bar, white background, and black symbol. The sizes and dimensions of mandatory/regulatory signs are given at **Table 14.4**.

14.6.2 *Bullock Carts Prohibited*

The sign shall be erected on each entry to the road where bullock carts are to be prohibited **(Fig. 14.04).**

Table 14.4 Size and Dimension of Mandatory/Regulatory Signs

Design Speed	Diameter (mm)	Border (mm)	Oblique Bar (mm)	Font Size (mm)
Up to 65 Kmph	300*	35	35	75
	600	50	50	100
66 - 80 Kmph	750	60	60	125
81 - 100 Kmph	900	75	75	150

101 - 120 Kmph	1200	100	100	225
121 - 150 Kmph	1500	125	125	250

**Prohibitory Signs in conjunction with traffic signal*

14.6.3 *Bullock Carts and Hand Carts Prohibited*

The sign shall be erected on each entry to the road where bullock and hand carts are to be prohibited. **(Fig. 14.05).** The sign shall be erected on each entry to the road where all types of slow moving vehicles except cycles are to be prohibited.

14.6.4 *Hand Carts Prohibited*

The sign shall be erected on each entry to the road where hand carts are to be prohibited **(Fig. 14.06).**

14.6.5 *Tongas Prohibited*

The sign shall be erected on each entry to the road where tongas are to be prohibited **(Fig. 14.07).**

14.6.6 *Horse Riding Prohibited*

The sign shall be used where Horse riding is prohibited on road. **(Fig. 14.08)**

14.6.7 *Auto Rickshaw not allowed*

The sign shall be used at the entrance to the roads where entry to auto rickshaw is prohibited **(Fig. 14.09).**

14.6.8 *Buses Prohibited*

The sign shall be used where buses are prohibited and used at beginning of such areas **(Fig. 14.10)**

14.6.9 *Cars Prohibited*

The sign shall be used where entry of car is prohibited **(Fig. 14.11).**

14.6.10 *Trucks Prohibited*

The sign shall be erected on each entry to the road where movement of trucks is prohibited **(Fig. 14.12).**

14.6.11 *Tractor Prohibited*

The sign shall be used where entry of tractor is prohibited. **(Fig. 14.13).**

14.6.12 *Construction Vehicles Prohibited*

The sign shall be used where entry of construction vehicle is prohibited. **(Fig. 14.14).**

14.6.13 *Articulated Vehicles Movement Prohibited*

The sign shall be used for prohibiting movement of Articulated Vehicles. **(Fig. 14.15)**

14.6.14 *Two Wheelers Prohibited*

The sign shall be erected on such highways or highway sections where the movements of two wheelers are required to be prohibited **(Fig. 14.16).**

14.6.15 *Cycles Prohibited*

The sign shall be erected on each entry to the road where cycles are to be prohibited **(Fig. 14.17)** such as Expressways and Flyovers.

14.6.16 *Pedestrians Prohibited*

The sign shall be used at the entry of roads where the movements of pedestrians are to be prohibited. **(Fig. 14.18)**

14.6.17 *Blowing Horn Prohibited*

The sign shall be used on stretches of the road where sounding of horn is not allowed, such as near hospitals and in silence zones **(Fig. 14.19).**

14.6.18 *Straight Prohibited/No Entry*

The signs shall be located at places where the vehicles are not allowed to enter. It is generally erected at the end of one-way road to prohibit traffic entering the roadway in the wrong direction and also at each intersection along the one-way road. The No Entry sign, if used, should be placed directly in view of a road user at the point where a road user could wrongly enter. The sign should be mounted on the left side of the roadway, facing traffic that might enter the roadway or ramp in the wrong direction. If the No Entry sign would be visible to traffic to which it does not apply, the sign shall be oriented in such a way that it is shielded from the view of that traffic. The sign may be repeated on long stretches if considered necessary **(Fig. 14.20).**

14.6.19 *One Way*

The sign shall be located at the entry to the one-way street and repeated at intermediate intersections on that street. At unsignalized intersections, ONE WAY signs shall be placed on the near left and the far right corners of the intersection facing traffic entering or crossing the one-way street. At signalized intersections, ONE WAY signs shall be placed either near the appropriate signal faces, on the poles holding the traffic signals, on the mast arm or span wire holding the signals, or at the locations specified for unsignalized intersections **(Fig. 14.21).**

14.6.20 *Left/Right Turn Prohibited*

At unsignalized intersection where a side road forms a T-junction with a two-way road and traffic is required to turn in one direction only, **Fig. 14.22** or **Fig. 14.23** as appropriate should be used. On the other hand, if direction control sign **Fig. 14.46** or **Fig. 14.47** is used, it might be misleading by giving an impression to drivers that they are turning to a one-way road. The signs shall also be used at the intersection of one-way street to supplement the one-way signs.

14.6.21 *Overtaking Prohibited*

The sign **(Fig. 14.24)** shall be erected at the beginning and at intervals within, of such sections of highways where sight distance is restricted, and overtaking will be hazardous. The sign may be dispensed with pavement markings as per IRC:35 provided for "No Overtaking Zones". The "No Overtaking" sign should be erected on each side of the road at the start of the affected length and should be supplemented by repeater signs at intervals not exceeding 400 m.

14.6.22 *U-turn Prohibited*

The sign shall be used at the places where vehicles are forbidden to make a turn to reverse direction of travel between the sign and the next intersection beyond it. The sign shall be erected at the start and at intervals along section of a road on which the controlling authority has authorized the prohibition. The spacing between any two successive signs should not exceed 120 m on each side of the road **(Fig. 14.25).**

14.6.23 *Right Turn & U-Turn Prohibited*

The sign shall be used where right turn & U-turn are prohibited **(Fig. 14.26).**

14.6.24 *Free Left Prohibited on Signalised Intersections*

The sign shall be placed at least 15 m before intersection equipped with traffic signal wherein left turn is not allowed on Red Signal **(Fig. 14.27).** Normally, such signs are warranted at locations where there is absence of channelisers at an intersection to facilitate the free movement of left turning traffic.

14.6.25 *Priority to Vehicles from Opposite Direction*

The sign **(Fig. 14.28)** shall be used to indicate that drivers must give priority to vehicles from opposite direction. It should be used only when vehicles at each end of priority sections are clearly visible to each other. The sign must not be displayed to traffic approaching from opposite directions. It must not be used upside down in an attempt to imply reversed priority.

14.7 No Parking, No Standing and No Stopping Signs

These signs are to be used at locations where Parking, Standing or Stopping of vehicles are to be prohibited. A parked vehicle implies ignition off and left unattended for certain period. Whereas Standing means a vehicle (ignition on or off) is halted at one place along with the occupant, that may be a person or the driver of the vehicle.

14.7.1 *Size, Shape and Colour*

The signs **(Fig. 14.29 and 14.30)** shall be of circular shape with a red border and blue background. There will be an oblique red bar at 45^0 for 'No Standing' sign and there will be two oblique red bars at 45^0 and right angles to each other for 'No Stopping' sign. The sizes and dimensions shall be as per **Table 14.4.**

14.7.2 *Combination with Definition Plate*

There shall be a definition plate below the signs carrying the words "NO STANDING" or "NO STOPPING" as applicable in English and other language as necessary. The scope of the prohibition may be explained by inscriptions on the definition plate specifying as the case may be

i) The days of the week during which the prohibition applies,
ii) The hours of the day during which standing is prohibited,
iii) The distance up to which the prohibition is applicable, and
iv) Exceptions granted for certain classes of road users.

In addition, the definition plate may exhibit a single-headed arrow pointing the direction in which the restriction is applicable if the sign is at the end of a zone, or a double-headed arrow pointing both ways if the sign is at an intermediate point in the zone.

14.7.3 *Location of 'NO STANDING' sign*

The sign **(Fig. 14.29)** shall be erected where the controlling authority has decided to prohibit standing of vehicle even for a short duration. The sign should be accompanied by suitable kerb or carriageway markings as indicated in IRC:35. A definition plate can be attached to sign post to convey the message more precisely.

14.7.4 *Location of 'NO STOPPING' sign*

The sign **(Fig. 14.30)** shall be erected on sections of a road or street where the controlling authority has decided to prohibit even momentary stopping of vehicles. A definition plate can be attached to sign post to convey the message more precisely.

14.7.5 *No Parking Signs in Urban Areas*

In urban areas, the "No Parking" sign is used on the roads to prevent any parking of vehicles on the main carriageway which will lead to congestion. This sign may be used along with time restriction, indicating morning and evening peak periods.The sign shall be placed at the start of the zone till the end of the prohibition zone. Signs should be erected within 25 m of the start and end of the prohibition. The "No Parking" sign shall be placed parallel to kerb facing the carriageway and sited approximately at 100 m intervals. Where signs are used without road markings, they should be placed strategically rather than at fixed intervals. The aim should be that wherever drivers might be tempted to stop, they should be able to see the sign. The spacing between consecutive signs, whether or not they are on the same side of the road, should be not more than 30 m. The sign can be accompanied by arrow showing the direction coupled with change of timings and adding of date where required. However, it is to be noted that such provision is possible only if the road owning agency resorts to electronic display of No Parking Signs by using the Variable Message Sign concept given in IRC:SP:85. A "No Parking" sign should be introduced only where there are no other on-street parking controls, even if they operate at different times of day. Where other controls are required, the "No Parking" sign should be replaced by a prohibition of waiting and loading sign provided accordingly **(Fig. 14.31).**

14.7.5.1 Parking Not Allowed on Footpath

The sign is to be erected where the parking is not allowed on footpath **(Fig. 14.32).**

14.7.5.2 Parking Not Allowed on Half of Footpath

The sign is to be erected where the parking is not allowed on half footpath **(Fig. 14.33).**

14.8 Speed Limit and Vehicle Control Signs

14.8.1 *Size, Shape and Colour*

The signs shall be of circular shape with a red border and with white background with black symbols and numerals. The sizes and dimensions shall be as per **Table 14.4**.

14.8.2 *Location*

These signs shall be erected at the beginning of any section of a road or the side of a structure, which is subject to prohibition or restriction so as to face the entering traffic. Additional signs shall be erected within the prohibited section at each intersection made by a road which is not subject to prohibition so as to face the entering traffic and inform it of the restriction. For speed limit, additional repeater signs may also be installed at suitable intervals where necessary.

14.8.3 *Axle Load Limit*

The sign shall be erected where entry is prohibited for vehicles whose axle load exceeds a particular limit. To indicate the presence of any weak bridge ahead a definition plate with "Weak Bridge Ahead" may be posted **(Fig. 14.34).**

14.8.4 Height Limit

The sign shall be erected in advance of an overhead structure where entry is prohibited for vehicles whose height exceeds a certain limit **(Fig. 14.35).**

14.8.5 *Length Limit*

The sign shall be erected where entry of vehicles exceeding a particular length is prohibited **(Fig. 14.36).**

14.8.6 *Load Limit*

The sign shall be erected where entry is prohibited for vehicles whose laden weight exceeds a certain limit **(Fig. 14.37).**

14.8.7 *Width Limit*

The sign shall be used where entry of vehicles exceeding a particular width is prohibited **(Fig. 14.38).**

14.8.8 *Maximum Speed Limit*

The sign shall be located at the beginning of the section of the road or area covered by a speed restriction, with numerals indicating the speed limit in km per hour. The speed limit should be marked in multiples of 5 km per hour **(Fig. 14.39)**.

Where different speed limits are to be imposed on certain classes of vehicle types this shall be specified separately so as to ensure that the numerals indicating the speed limit are clearly visible from a distance. Symbol of specific vehicle type shall accompany such speed limit indication **(Fig. 14.40a and Fig. 14.40b).** In case of more than two vehicle categories, two separate boards shall be installed with minimum clear visibility distance in between them. For sections having poor road crash history or substandard curves, speed limit sign can be provided in a yellow backing board to make it more prominent. Also, the advisory speed limit can be attached to the sign post as supplementary plate indicating the permissible speed for the particular curve.

14.8.9 *Speed Limit Repeater and Terminal Signs in Urban and Rural Areas*

The speed limit sign in cities shall be placed on each of the roads where the speed changes or on the exit arms of the junctions. The vehicles travelling through a major junction are reassured about the speed limit on the new road by placing a speed limit sign within a maximum distance of 100 m from the intersection. The distance can be further increased by another 100 m in case of existence of bus bay or any another form of space constraints. The size of speed limit signs (the first sign indicating the changed speed on major road after crossing the junction) shall be 600 mm, except for the dual carriageway roads with speed limit of 50 Kmph or more, where the sign size shall increase to 900 mm. The repeater sign shall be placed on urban roads at interval given in **Table 14.5**.

Table 14.5 Placement of Repeater Sign on Urban Roads*

Speed Limit (Kmph)	Size of Sign (mm)	Maximum Distance (m) between		
		Consecutive Signs on Alternate Sides of Carriageway	Consecutive Signs on the Same Side of Carriageway	Terminal Sign[1] and First Repeater
Below 40	600	200	300	200
50	600	250	400	200
60	600	350	500	250
80	900	450	700	350

[1]Terminal Sign is used to indicate the start of a speed limit.

**For rural highways, the consecutive speed limit repeater signs may be placed at a distance not more than 2.5 km if placed on alternate sides and not more than 5 km if placed on the same side.*

14.8.10 *Gateway Signs*

Gateway signs **(Fig. 14.4)** shall be used with backing boards to distinguish the new speed limit applicable at the approach road. Such signs boards shall be placed on approach to a town or an old town area, or on local roads merging with any arterial/sub-arterial roads.

Fig.14.4 Gateway Signs at the Approach/Entrance to a Town or Village

14.8.11 *Stop for Police Check*

The sign shall be erected where the police personnel plans to conduct the checks. **(Fig. 14.41).**

14.9 Restriction End Sign (Fig. 14.42)

14.9.1 *Size, Shape and Colour*

It shall be circular with white background. There shall be a diagonal band of black at an angle of 45° sloping downward from right to left. The sizes and dimensions of these signs shall be as per **Table 14.4** without the borders.

14.9.2 *Purpose*

This sign shall indicate the point at which all prohibitions notified by prohibitory signs for moving vehicles ceases to apply. However, the applicable speed limit sign needs to be erected within 100 m from the above sign.

14.10 Compulsory Direction Control and Other Signs

14.10.1 *Size, Shape and Colour*

These signs shall be circular in shape with blue background and white border, and having symbols in white. The sign shall have the dimensions given as in **Table 14.6.**

Table 14.6 Dimensions of Compulsory Direction Control Sign

Design Speed	Diameter (mm)	Border (mm)
Upto 65 Kmph	300*	10
	600	20
66 - 80 Kmph	750	25
81-100 Kmph	900	30
101-120 Kmph	1200	40
>120 Kmph	1500	50

** in conjunction with traffic light signal*

14.10.2 *Compulsory Ahead, Compulsory Ahead or turn Left/Right*

The signs in **Fig. 14.43, Fig. 14.44 and Fig. 14.45** indicate the routes that are lawfully to be taken and direction of movement with respect to the position of sign installed.

14.10.3 *Compulsory Turn Left/Right*

The signs in **Fig. 14.46** and **Fig. 14.47** indicate the routes that are lawfully be taken and direction of movement with respect to the position of sign installed. **Fig. 14.47** should be used on Central Island of a roundabout which can be easily visible for the drivers on the approach road. For smaller/mini roundabouts *i.e.* Diameter less than 10 m, **Fig. 14.47a** shall be used for directing the vehicles entering the junction to give priority to vehicles from the right. Where compulsory turn left or right sign is installed in advance of junction approximately 50 m ahead, signs as **Fig. 14.48 or Fig. 14.49** as appropriate should be used.

14.10.4 *Compulsory Keep Left/Right*

The sign in **Fig. 14.50** shows keep left sign which is used at traffic islands, refuges, and at the beginning of central median of a divided carriageway. It is used at the recommencement of central median following a gap, as traffic turns right in front of the sign without actually passing it. Keep right sign (**Fig. 14.51)** shall be used in combination with traffic calming schemes and also in association with road works. The sizes of 300 mm for **Fig. 14.50** and **Fig. 14.51** can be considered when installed integrating with Object Hazard Markers on a single foundation.

14.10.5 *Pass either Side*

The "Pass either Side" sign as shown in **Fig. 14.52** is for use on traffic islands, usually in one-way roads, where drivers passing either side of the sign reach the same destination immediately ahead. It must not be used in situations where drivers would become committed to different destinations once they had passed the sign. In this case, a plain-faced bollard or Two-way Hazard Marker **(Fig. 15.78)** should normally be provided. Where flag type direction signs have been erected on the traffic islands, it becomes clear without the compulsory direction sign.

14.10.6 *Minimum Speed Limit*

Where engineering judgment determines that slow speeds, especially on an expressway, might impede the normal and reasonable movement of traffic, the Minimum Speed Limit sign shall be installed to indicate the minimum legal speed **(Fig. 14.53)** on an expressway. This shall be used on specific sections to avoid the slow moving vehicles acting as a hindrance so as to improve the efficiency of the traffic movement on the expressway. It is compulsory to install the "Restriction End" sign at the end of the minimum speed limit sign when restriction of minimum speed is applied for a section of the road.

14.10.7 *Compulsory Cycle Track/Cycles only*

The sign shall notify cyclists that they must use the cycle track at the entrance to which it is placed, and shall notify the drivers of other vehicles that they are not entitled to use that track **(Fig. 14.54).**

14.10.8 *Compulsory Cyclist and Pedestrian Route*

The sign shall be used to segregate cycle and pedestrian lanes **(Fig.14.55).**

14.10.9 *Pedestrians only*

The sign shall mean that only pedestrians are allowed and the traffic is not allowed on this road/ carriageway. The sign may be supported by supplementary plate with 'PEDESTRIANS ONLY' written on it **(Fig. 14.56).**

14.10.10 *Compulsory Snow Chain*

The sign shall be used in hilly areas for compulsory use of snow chain on all vehicles **(Fig.14.57).**

14.10.11 *Busway/Buses only*

The sign shall mean that only buses are allowed and the other traffic is not allowed on this road/ carriageway. The sign may be supported by supplementary plate with 'BUSES ONLY' written on it **(Fig. 14.58).**

14.10.12 *Compulsory Sound Horn*

The sign shall mean that the motor vehicles shall compulsorily sound horn at the location at which sign is placed, for instance at sharp curves on hill roads **(Fig. 14.59).**

15. CAUTIONARY/WARNING SIGNS

15.1 The detailed dimensioned drawings of 900 mm sized sign and symbols thereon are shown in **Plate-II** for ease of reproduction. For signs of other sizes, the symbols should be proportionately reduced or enlarged. The cautionary/warning signs are listed in **Annexure-II.**

15.2 Size, Shape and Colour

The signs shall be in the shape of an equilateral triangle, with apex pointing upwards. It shall have red border and black symbols on white background. The size and siting details shall be as per **Table 15.1.**

Table 15.1 Sizes and Dimensions of Cautionary/Warning Sign & Siting Distances

Design Speed	Side (mm)	Border (mm)	Clear Visibility Distances (m)	Distance of Sign from Hazard (m)
Upto 50 Kmph	600	45	45	45
51-65 Kmph	750	60	60	45-110
66- 80 Kmph	900	70	70	110-180
81-120 Kmph	1200	90	90	180-245
121-150 Kmph	1500	110	110	245-305

15.3 Location and Mounting

Warning signs should not be mounted on the same post as a STOP or GIVE WAY or terminal speed limit sign, nor mounted on a traffic signal post. When mounted with other types of sign, the triangular warning signs should always be mounted at the top. Where two or more warning signs are erected together, the sign relating to the hazard first encountered should be placed uppermost. When a new sign is added to an existing post, it is important to ensure that the correct order is maintained, if necessary adjusting the position of the existing signs. The warning signs should normally be located depending upon the design speed (as given in **Table 15.1)** in advance of the hazard warned against. Distances may be increased on steep downhill gradients to account for higher speed. Where advance direction signs are posted in advance of the intersections, the warning signs relating to these junctions could be avoided to eliminate the crowding of signs.

15.4 Left/Right Curve

These signs are to be used, whenever there is a need for reduction of speed due to change of direction of alignment and radii of the curvature are below the specified limit. These signs are intended to warn the driver to reduce the speed and proceed cautiously. The warning signs are to be used sparingly. If a road has certain curves where vehicles cannot be allowed to negotiate with the absolute speed limit or the general operating speed established for the road, such curves shall be provided with curve warning signs on both approaches. Supplementary plate indicating advisory speed limit can also be provided along with cautionary sign considering the level of restriction required on the curve. Ideally if the difference between the approach speed to a curve and the safe negotiating speed derived based on geometric parameters of curve exceeds 15 Kmph, the curve shall be provided with curve warning sign. In the case of sharper curves, it is essential to fortify the curve with the applicable type of Chevron Sign i.e. Single or Double Chevron signs as per the spacing given in Section 15.65. The left hand curve sign should be used to mark curves bending to the left and the right hand curve sign for curves bending to the right **(Fig. 15.01 and 15.02).** For curves with side road or cross roads **Fig. 15.01a to 15.01d** and **15.02a to 15.02d** can be used.

15.5 Right/Left Hairpin Bend

The sign should be used to mark curves of small radii, where the change of direction is so considerable as to amount to a reversal of direction. The symbol should bend to left or right according to the road alignment **(Fig. 15.03 and 15.04).**

15.6 Right/Left Reverse Bend

The sign should be erected where two curves in opposite direction are separated by a tangent less than 120 m in length in plains and 30 m in hills. The sign may also be erected where in the opinion of the controlling authority, the nature of the reverse bend is not obvious to approaching drivers and constitutes a hazard. If the first curve is to the right, a right reverse bend sign shall be used. If the first curve is to the left, a left reverse bend sign shall be used **(Fig. 15.05 and 15.06).**

15.7 Series of Bends

This sign should be used to caution the driver of the presence of zig-zag for a long distance over the section of road ahead. The sign may be posted 50-100 m ahead of the section under consideration. The sign may be repeated at appropriate intervals if the zig-zag road is long **(Fig. 15.07)**. Further, it is essential to fortify entire curve with the applicable type of Chevron Sign i.e. Single or Double Chevron Signs based on the radii of the curve as per the spacing given in Section 15.65.

15.8 270 Degree Loop

The sign shall be used to caution the vehicles about 270 Degree sharp loop. The sign shall be placed at the beginning of such area. **(Fig. 15.08)**

15.9 Side Road

The sign should be erected **(Fig. 15.09 and 15.10)** in advance of the main road intersections where in the opinion of the controlling authority, a sufficiently large volume of entering traffic together with restricted sight distance is likely to constitute a hazard. The sign should only be used when the drivers need to be warned of the existence of a junction and no other indication, e.g., by an advance direction sign or traffic signal is given.

15.10 Y-Intersection

The sign should be erected on the approach to a bifurcation of any road. This sign should only be used when the driver needs to be warned of the existence of a junction and no other indication, e.g. by an advance direction sign or traffic signal, is given **(Figs. 15.11, 15.12 and 15.13).**

15.11 Cross Road

The sign should be erected in advance of the cross road where in the opinion of the controlling authority, a sufficiently large volume of crossing or entering traffic together with restricted sight distance is likely to constitute a hazard. This sign should only be used when the drivers need to be warned of the existence of an intersection and no other indication, e.g., by an advance direction sign or traffic signal, is given **(Fig. 15.14).**

15.12 Roundabout

The sign should be used where it is necessary to indicate the approach to a roundabout and adequate warning is not conveyed by a map type advance direction sign **(Fig. 15.15)**.

15.13 Traffic Signals

This sign can be used to caution the drivers of the presence of traffic signals at either of the following two conditions. Such sign shall be posted near a critical signalized intersection on rural highways (where provision of traffic signal is a rarity) or also at locations where the visibility of signal is obscured for a distance (refer **Table 15.1**) to permit the road user to respond in urban areas **(Fig. 15.16)**.

15.14 T-Intersection

The sign should be erected in advance of T-junctions where in the opinion of the controlling authority, the nature of the intersection is not obvious to approaching drivers. The width of bands should indicate the relative importance of the roads. This sign should only be used when the driver needs to be warned of the existence of a junction and no other indication, e.g., by an advance direction sign or traffic signal, is given **(Fig. 15.17 and Fig.15.18)**

15.15 Major Road Ahead

The sign should be erected in advance of crossing with a major road, where in the opinion of the controlling authority, a sufficiently large volume of traffic together with restricted sight distance is likely to constitute a hazard. This sign should only be used when the driver needs to be warned of the existence of a junction and no other indication, e.g., by an advance direction sign or traffic signal, is given **(Fig. 15.19)**.

15.16 Staggered Intersection

The sign should be used to indicate junctions where the distance between two junctions does not exceed 60 m. This sign should only be used when the driver needs to be warned of the existence of a junction and no other indication, e.g., by an advance direction sign or traffic signal, is given **(Fig. 15.20 and Fig. 15.21)**.

15.17 Merging Traffic Ahead

This sign is posted in situations where the traffic from other road is merging and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.22)**. In special cases of interchanges, there can be merging from the right hand side also, for which appropriate sign shall be used as shown in **Fig. 15.22a.**

15.18 Narrow Road Ahead

The sign should be erected on such sections of roads where in the opinion of the controlling authority, a sudden reduction in width of pavement causes a danger to traffic **(Fig. 15.23)**.

15.19 Road Widens

The sign should be erected on such sections of roads where in the opinion of the controlling authority, the sudden widening of a road causes a danger to traffic, such as, a two-lane road suddenly widening to a four-lane undivided carriageway **(Fig. 15.24).**

15.20 Narrow Bridge Ahead

The sign should be erected on roads in advance of bridges where the clear width between kerbs or wheel guards is less than the normal width of the carriageway **(Fig. 15.25)**.

15.21 Steep Ascent

The sign should be used 30 m before a steep upgrade where the erecting authority considers that the steepness of the upgrade warrants a warning to the road users. A gradient of 10 percent

and above may be considered steep gradient for this purpose. The sign should not be used unless the gradient continues for a length of about 500 m to 1 km. It should be repeated at suitable intervals in the stretch having the steep ascent **(Fig. 15.26)**.

15.22 Steep Descent

The sign should be used 30 m before a steep downgrade, where the erecting authority considers that the steepness of the grade may constitute a hazard to traffic. A gradient of 10 percent and above may be considered as a steep gradient for this purpose. The sign should not be used unless the gradient continues for a length of about 500 m. It should be repeated at intervals in the stretch having the steep descent **(Fig. 15.27)**.

15.23 Reduced Carriageway

This sign is used to caution the driver of the reduction in the width of the carriageway ahead. This is applicable to undivided carriageway when some portion of the carriageway is closed or reduced for maintenance or repairs **(Fig. 15.28 and Fig. 15.29).**

15.24 Start of Dual Carriageway

This sign is posted when a single carriageway ends up into dual carriageway. The sign may be posted at a distance of 100 m from the start of dual carriageway **(Fig. 15.30)**.

15.25 End of Dual Carriageway

This sign is posted when dual carriageway is ending and single carriageway is starting. The sign may be posted at a distance of 100 to 150 m from the end of dual carriageway **(Fig. 15.31)**.

15.26 Gap in Median

The sign should be installed ahead of a gap in the median of a divided carriageway, other than at intersection **(Fig. 15.32)**.

15.27 Pedestrian Crossing

The sign should be erected in advance on both approaches to uncontrolled pedestrian crossings. This is absolutely essential when visibility of the crossing is impaired by a bend or hump in the road **(Fig. 15.33)**. In the case of crash prone locations involving pedestrians, the sign shall be repeated at a short distance ahead of the pedestrian crossing, indicating the distance to the crossing with a supplementary plate, i.e. **Fig. 15.33** + Supplementary plate indicating "20m".

15.28 School Ahead

The sign should be erected where school buildings or grounds are adjacent to the road, and where in the opinion of the controlling authority, passing traffic can create a hazard to children **(Fig. 15.34).** The background shall be fluorescent yellow-green colour. Additionally, supplementary boards can be provided showing the school timings.

15.29 Built Up Area

The sign shall be used to caution the vehicles about Built up Area. The sign shall be placed at the beginning of such area **(Fig. 15.35).**

15.30 Two Way Operation

This sign is used to caution the driver of a changed pattern of traffic condition on a carriageway expected to carry traffic in one direction only. For example, on a dual carriageway, the entire traffic is diverted to one side because of emergency or road work. In this situation, drivers are warned by posting this sign **(Fig. 15.36)**.

15.31 Two Way Traffic on Cross Road Ahead

This sign is posted in situations where the traffic on the cross road ahead is two-way and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.37).**

15.32 Lane Closures

This sign is used to caution the driver of the closure of a portion of the carriageway on multi-lane highways **(Fig. 15.38, 15.39 and 15.40).**

15.33 Traffic Diversion on Dual Carriageway

This sign is used to warn the driver of the diversion of traffic from one carriageway to the other. Mostly it is used on dual carriageway when one carriageway is closed for maintenance or due to an incident **(Fig. 15.41)**.

15.34 People at Work

The sign should be displayed only when people or machines are working on the road or adjacent to it or on overhead lines or poles. The background colour of the sign shall be yellow as per IRC:SP:55.The sign should be removed immediately after the work is completed **(Fig. 15.42).** The sign is generally located on the approach side of the work zone or area and another sign with supplementary plate "END" shall be provided at the leaving side of the work zone where traffic reverts back to normal flow of traffic.

15.35 Danger Warning Sign

This sign is posted in situations where the vehicle drivers may face any kind of danger and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.43)**.

15.36 Differently Abled Persons/Deaf or Blind Persons Likely on Road Ahead

This sign is posted only near the schools or institutions meant for differently abled persons/ hearing impaired persons/blind persons **(Fig. 15.44 (Differently Abled) and Fig. 15.45a (Deaf Persons) and Fig. 15.45b (Blind Persons).** Supplementary plates shall be used along with these signs.

15.37 Cycle Crossing

The sign should be erected in advance of all uncontrolled cycle crossings **(Fig. 15.46)**.

15.38 Cycle Route Ahead (Warning for Cycles on Road Ahead) (Mixed Traffic Conditions)

This sign is posted in situation where the Cycle Route is approaching, and drivers are required to slow down **(Fig. 15.47)**.

15.39 Dangerous Dip

The sign should be erected where a sharp dip in the profile of the road or a causeway is likely to cause considerable discomfort to traffic **(Fig. 15.48)**.

15.40 Speed Breaker

This sign should be used to warn the drivers of the presence of the speed breaker. This sign should be posted at a minimum distance of 50 to 60 m in advance of the speed breaker location **(Fig. 15.49)**. If required, the sign shall be repeated at a short distance ahead of the speed breaker, indicating the distance to the speed breaker with a supplementary plate, i.e. **Fig. 15.49** + Supplementary plate indicating "20m". Such speed breakers should be constructed at the identified crash prone locations.

15.41 Rumble Strip

The sign should be posted at a minimum distance of 50 to 60 m in advance of the rumble strips provided on the road to control and reduce the speed. This is to warn the drivers of the presence of the rumble strips **(Fig. 15.50)**. If required, the sign shall be repeated at a short distance ahead of the rumble strips, indicating the distance to the rumble strip with a supplementary plate, i.e. **Fig. 15.50** + Supplementary plate indicating "20m". Such rumble strips should be constructed at the identified crash prone locations.

15.42 Rough Road

This sign is posted in situations where the road is rough and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.51)**.

15.43 Soft Verges

The sign should be used toward the users about the presence of soft verges and to alert that driving on the verge might result in the damage of the verge or the vehicle becoming stuck **(Fig. 15.52)**.

15.44 Loose Gravel

The sign should be used on section of a road on which gravel may be thrown up by fast moving vehicles. The sign should be removed immediately after the hazard is remedied **(Fig. 15.53)**.

15.45 Slippery Road

The sign should be erected to warn that the section of the road ahead may be particularly slippery. The sign should be removed immediately after the hazard is remedied **(Fig. 15.54).**

15.46 Slippery Road because of Ice

This sign is posted in situations where the road has ice and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.55).**

15.47 Opening or Swing Bridge

This sign is posted in situations where the swing road bridge exists, and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.56)**.

15.48 Overhead Cable

This sign is used to caution the driver of the presence of overhead power transmission lines **(Fig. 15.57)**.

15.49 Play Ground Ahead

The sign shall be used to caution the vehicles about playground approaching. The sign shall be placed at the beginning of such area **(Fig. 15.58).**

15.50 Quay Side or River Bank

This sign is used to caution the driver of the presence of the impending danger by the side of the road due to presence of the water body **(Fig. 15.59)**.

15.51 Barrier

The sign should be erected in advance of a gate controlling entry into a road. A pair of signs should be used for the purpose: (i) a warning sign with a definition plate bearing the words "SLOW, BARRIER AHEAD" installed at a distance of 200 m from the barrier and (ii) another warning sign with a definition plate bearing the words "DEAD SLOW, BARRIER AHEAD" installed at a distance of 50 to 100 m in plain and rolling terrain and 30 to 60 m in hilly terrain. In case of toll barriers, the words "BARRIER AHEAD" may be replaced by "TOLL BARRIER AHEAD" **(Fig. 15.60)**.

15.52 Sudden Side Winds

This sign is used to caution the driver of the danger of side winds, which endanger the lives of travelers. This sign is posted at places where such adverse weather conditions exist quite often. This will enable the driver to proceed cautiously and act appropriately in case of emergency **(Fig. 15.61)**.

15.53 Tunnel Ahead Warning

The sign is posted in situations where the traffic approaches a tunnel and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.62).**

15.54 Ferry

The sign is intended to warn the drivers about the existence of a ferry crossing across a river. It is recommended that pair of signs be used for this purpose, one for advance warning located at 200 m from the ferry, and the second erected near the ferry. The distance of the second sign from the ferry may be 50 to 100 m in plain and rolling country and 30 to 60 m in hills depending on the design speed **(Fig. 15.63)**.

15.55 Tram Crossing

The sign shall be used to caution the vehicles about approaching Tram Crossing. The sign shall be placed at the beginning of such area. **(Fig 15.64)**

15.56 Falling Rocks

The sign should be erected wherever rocks are liable to fall on the road either seasonally or throughout the year. The symbol may be reversed to show the side from which rock fall is expected. The highway authorities should cover the signs during the season when this problem does not exist **(Fig. 15.65)**.

15.57 Cattle Crossing

The sign should be erected where there is danger due to farm animals or cattle crossing on the road. The sign should not be used simply because animals are driven along or across the road at frequent intervals but should be used where they cross regularly **(Fig. 15.66).**

15.58 Wild Animals likely to be on Road Ahead

This sign is posted in situations where the wild animals may cross the road and the drivers are required to slow down their vehicles for safe travel **(Fig. 15.67)**.

15.59 Queues Likely Ahead

This sign is posted in situations where the road is congested due to heavy vehicular movement and the drivers are required to slow down their vehicles or avoid that road for safe travel **(Fig. 15.68)**.

15.60 Low Flying Aircraft

This sign is for use on roads skirting or in the vicinity of airfields/airports where road users are likely to be startled by low-flying aircraft or by sudden noise from aircraft. It will be usually more effective for this sign to be sited further in advance of the flight path (50-100 m), accompanied by a distance plate as an aircraft might be virtually overhead before a driver sees the sign **(Fig. 15.69).**

15.61 Unguarded Railway Crossing

The sign should be used on the approaches of railway level crossings where there are no gates or other barriers. A pair of signs shall be used for the purpose: (i) an advance warning sign

located at 200 m away from the crossing and (ii) a second sign to be erected near the crossing. The distance of the second sign from the crossing may be 50-100 m in plain and rolling terrain and 30-60 m in hilly terrain **(Fig. 15.70)**. A rectangular white plate with one or two red bands as shown in **Fig. 15.70,** shall be provided at the bottom of the sign.

15.62 Guarded Railway Crossing

The sign should be used to warn traffic on the approaches to guarded railway crossings. A pair of signs shall be used for the purpose (i) an advance warning sign located at 200 m away from the crossing and (ii) a second sign to be erected near the crossing. The distance of the second sign from the crossing maybe 50-100 m in plain and rolling terrain and 30-60 m in hilly terrain **(Fig. 15.71)**. A rectangular white plate with one or two red bands as shown in **Fig. 15.71,** shall be provided at the bottom of the sign.

15.63 Crash Prone Area Ahead Sign

The sign should be used on approach of identified crash prone locations (**Fig. 15.72**). However, the road owning agency should take necessary steps to improve the safety at such locations and remove this sign after that. This implies that the placement of the sign shall serve as a stop gap arrangement till the improvement of such crash prone locations.

15.64 U-Turn Ahead Sign

The sign shall be placed about 80 to 100 m before to warn the traffic about the presence of U turning facility and that drivers are required to slow down their vehicles for safe travel. A supplementary board (written in English or vernacular language) can be used to notify the road users about U-turn facility ahead **(Fig. 15.73).**

15.65 Chevron Signs

At the curved alignment of a roadway, the chevron signs shall be used to inform the drivers about sharpness of curve. The chevron sign shall be a vertical rectangle and shall be installed always on the outside of a turn or curve, in line with and at approximately right angle to approaching traffic. Use of a single board of chevron sign for delineating a curve should be avoided. Spacing of chevron signs should be such that the road user always has at least two signs in view, until the change in alignment eliminates the need for the sign as given in **Table 15.2**. Chevron signs should be visible for a sufficient distance to provide the road user with adequate time to react to the change in alignment.

Table 15.2 Spacing between Chevron Sign Boards

Curve Radius (m)	Distance between Chevron Sign Boards (m)	
	On Curve	Before Curve (on the transition length if any)
50	15	30
100	20	40
200	30	60

300	45	90
400	60	120
450	70	140
451-750	75	150
>750*	80	160

**If deflection angle is greater than 20^0 for curves with radius up to 1200 m*

Depending upon the sharpness of curve, Single Chevron sign (**Fig. 15.74**), Double Chevron sign (**Fig. 15.76**) and Triple Chevron sign (**Fig. 15.77**) can be installed. When the deflection angle is greater than 90 degree, double chevron signs shall be used. Triple chevron sign shall be essentially used at the hairpin bends, loops of the interchanges and preferred at central islands of a roundabout. If the Single Chevron signs are preferred to be used for roads operating at or more than 100 Kmph, bigger size of 750 mm x 900 mm **(refer Fig. 15.75**) shall be used.

15.66 Hazard Marker

Roadside hazard like bridges, trees which are coming in the roadway are to be illuminated by retro reflective Object Hazard Markers (OHM) and for a left side hazard, **Fig. 15.78** shall be used and for a right side hazard, **Fig. 15.79** shall be used. If traffic is allowed to pass on either side of the triangular island, two-way Object Hazard Marker (**Fig. 15.80**) shall be used.

16. INFORMATORY SIGNS

16.1 The signs illustrated in this section give information to the road user regarding their location or facilities available in the vicinity or about the destination. The detailed dimensioned drawings for direction information signs with guidance for design are shown in **Plate-III** and design principles are presented in **Annexure-III.** For facility information signs 600 mm x 800 mm sizes are shown in **Plate-V** and signs of other sizes the symbols should be proportionately reduced or enlarged. The facility information signs are listed in **Annexure-IV.**

16.2 The signs are classified under the following sub-heads keeping in view their design and application:

1) Direction and Place Identification Signs
2) Facility Information Signs
3) Other Useful Information Signs
4) Parking Signs, and
5) Flood Gauge

16.3 Direction and Place Identification Signs

- The following are the functions of the direction signs:
- It should give drivers advance information of their approach to a junction.
- It should indicate the type of junction.
- It should inform them of the destinations that may be reached from each exit.
- It should identify the route and indicate its status within network.

16.3.1 *Shape, Colour and Language of Inscription*

These signs shall be rectangular. However, direction signs may be in the shape of an elongated rectangle with the longer side horizontal, terminating in an arrowhead. The colour pattern for direction signs are given in **Table 8.3** and size of the letters shall be as per **Table 12.1.** The English font shall be "Transport Medium", Hindi shall be "Hindi7/Narad Bold" and regional language fonts shall be as per local practice. The lettering for names of places, streets, and highways on conventional road guide signs shall be a combination of lower-case letters with initial upper-case letters which would facilitate easy comprehending of the communicated messages on the signs by the road user. The design principles are presented pictorially in **Fig. 16.01 to 16.17**. All messages, borders, and legends shall be retro-reflective and all background shall be retro-reflective.

16.3.2 *Advance Direction Signs*

The sign indicates the routes ahead by showing the names of particular places with arrow symbols indicating directions. If desired, distance of places in km may be shown after the destination names. If more than one place is to be shown in the same direction, the names of the places may be grouped and a single arrow used for direction indication. Names/Group of names of places be separated by a line as shown in **Fig. 16.01**. These are called as stack type sign. On high speed roads where the junctions are complex in layout, large size signs (map type signs) shown in **Fig. 16.02** may be employed. In situation where rotary (roundabout) inter-section exists, signs as shown in **Fig. 16.03** may be employed. The signs can be either shoulder mounted or cantilever or gantry mounted as per **Table 16.1**. The sign shall normally be located at a distance from the intersection as given in **Table 12.1**.

Table 16.1 Types of Mounting Forms for Direction Signs and Suggested Usage Guidelines

Mounting Form	Characteristics	Suggested Locations
Roadside	Side-mounted signs over the verge.	Generally appropriate for all types of roads with adequate roadside space.
Cantilever	Overhead signs partially over the carriageway.	Generally, more economical for smaller directional signs.
Gantry	Overhead signs spanning over the carriageway.	Appropriate for larger signs, heavy traffic flow, traffic lanes >=3 and lane drops.
Double/Butterfly Cantilever	Overhead signs on separator/ divider, partially over the carriageway on both sides of the separator/divider.	Recommended only when approach speed is low or deployment of crash cushion is assured on the median

Advance Direction Signs shall be for showing directions and destinations with arrows, and whenever applicable can be with route numbers (with icons) and distances also. Junction name panel can be added at the top of the advance direction signs. Additionally, cautionary and regulatory signs like speed limit, height limit, tunnel ahead etc., and NH, SH and Other Route Marker signs can be inscribed along with the destination names as shown in **Fig. 16.01a**.

16.3.2.1 Use of Symbols

The use of symbols is desirable on the directions and place identification signs as long as they are readily understood by all drivers including those coming from other countries. Symbols as given in **Plate-VIII** are desirable to indicate the followings:

- Airports
- Ports and docks
- Industrial zones
- Hospitals
- Border crossing points
- Parking areas, rest areas
- Railway stations
- Park and Ride facilities
- Filling stations
- Service areas facilities- toilet, refreshment, restaurants, lodgings, repair service etc.
- Entry or Restriction of Vehicle types (goods vehicles, articulated vehicle, buses, cars, motorcycles)
- Expressway symbol
- Tourist attractions symbols- viewpoints, picnic sites etc.
- Pick up and Drop off

16.3.2.2 Map Type Advance Direction Signs

- Map type of sign is designed based on the junction configuration and geometry. However, it shall be modified in terms of shape and composition for increasing the clarity and aesthetics.
- In a roundabout junction sign, the recommended minimum angle for cut-out is 25°. The purpose of the cut-out is to emphasize that all traffic must travel in a clockwise direction.
- Where a roundabout is offset from the main direction of travel, it may be appropriate to show a curved approach arm on the advanced direction sign.

16.3.2.3 Siting of Advance Direction Signs

Junction Reference point: The distance in advance of junction at which Advance Direction signs should be sited is measured from the junction reference point. The reference point is defined below.

In the case of Interchange, the point at which carriageway widens to form the exit road and for at-grade Junctions from:

- STOP or Give Way line
- The point at which the carriageway first widens to form additional turning lanes or slip roads.

The standard distances at which Advance Direction sign would be sited are shown in **Table 12.1**. This shall be applicable for expressways or highways with major interchanges. However, if the distance between two successive junctions is less than 1 Km which is a common phenomenon in most of the urban areas in the country, only one Advance direction sign shall be used.

For grade separated intersections, i.e. where the traffic movement occurs on two or more than two levels, two or three advanced direction signs should be provided. The first Advance Direction sign is located 750 m to 1.5 km from the exit, which should be preferably gantry mounted sign. The second advance direction sign is located 250 m to 750 m from the exit. It should be gantry mounted; but at intersections where the number of through lanes remains constant, it may be shoulder mounted. Additionally, a map type and stack type direction sign shall be installed at 100 m to 250 m ahead of exit **(Fig. 16.14).**

16.3.2.4 Stack Type Advance Direction Sign

- Stack type signs are intended for use only at simple junctions and should not indicate more than three directions as the sign would then become difficult to read
- Both the arrow and the panel are centered vertically on the sign
- Arrows may be vertical or horizontal or at any angle (increments of 22.5°)

When more than one destination is shown, following should be considered:

- Destination ahead with vertical arrow on right hand side of destination name and both right aligned
- Destination to the left with the arrow on the left of the destination name and both left aligned
- Destination to the right with the arrow on the right of the destination name and both right aligned

16.3.2.5 Destination Sign

The sign should be posted in advance at intersections of major importance or at intersections where approach speeds are high requiring advance information. The forward destination name with vertical arrow shall be the top panel, the left destination with arrow shall be the middle panel, and the right destination with arrow at the bottom of the assembly. The maximum number of destinations in a single destination sign shall not exceed three (**Fig. 16.01**). If more than 2 languages (English and 2 local languages) are to be inscribed in a single direction sign board, the number of destinations shall be limited to two. Alternatively bilingual repeater signs having 'Local language and English', 'Hindi and English' can be considered as option.

16.3.3 *Direction Sign (Flag Type)*

The sign (**Fig. 16.04**) shows where a road leads to and indicates the names of towns; railway stations, airports or public centers, and the distance by road to them. Direction is indicated by

the arrowhead at the end of the sign board, the board being placed generally parallel to the road leading to the place named. These types of sign are called as Flag type signs. The siting of the direction sign shall be as per the provisions of **Table 12.1**. It should be visible to the drivers both during approach and while making the turn (with minimum clear visibility distance). This design principle may also be used for signs indicating street names in urban areas with a vertical clearance of at least 1 m from the paved surface when placed on the median or channelized island or parallel to the carriageway on footpath.

Finger type signages shall be considered for the pedestrian predominant streets. Finger type signs shall indicate street names or direction information in urban areas, which may be designed for the font height of 30 mm to 50 mm. This type of signs shall be erected in the existing structures like electric poles or shall be with new signpost with a minimum clearance of 2.1 m.

16.3.4 *Reassurance Sign or Route Confirmatory Sign*

This sign **(Fig. 16.05)** should be erected on important roads beyond an intersection or junction, to reassure a driver of a vehicle that the desired direction is being followed. A route confirmatory sign shall normally show the route number, destination ahead and distance to the destination. If two place names along with their distances have to be shown, the upper name should be of the place coming first along the route and if two places are located at same distance, then the place with larger population or maximum importance on the route shall come on the top panel.

16.3.4.1 Siting of Reassurance Sign

It should be placed 60 m beyond the far shoulder or curb line of the intersected road of the junction. In urban areas, reassurance sign may be placed in between intersections so as to keep the user informed.

The names of the destination places should be the same as shown on the advance direction signs placed before the intersection. For major interchanges, it should be placed within a distance of 200 m from the last point at which vehicle could join the main carriageway. It may also be used along a route at spacing not greater than 10 km on highways or expressways.

16.3.5 *Place Identification Sign*

The sign **(Fig. 16.06)** should be used along highways to mark entrance to the place or city. It should be erected at the entrance to the area under the jurisdiction of the local authority.

16.3.6 *Truck Lay-by*

Along the highways, the provision of Truck Lay-by has become necessary and as such the truck drivers must be adequately informed of the availability of such a facility. The sign of the type shown in **Fig. 16.07** is to be provided with the directional arrow showing the direction in which the facility is located. These signs are to be posted in advance at 250 m and 500 m ahead of the location where truck lay-by is provided.

16.3.7 *Toll Booth Ahead*

The sign is used to indicate the location of toll booth where fee is levied and collected from the road users for their use of road facilities. The sign shown in **Fig. 16.08** is to be provided as shoulder mounted. The sign with supplementary plates mentioning the distances shall be posted at 500 m and 1000 m ahead of the toll booth location.

16.3.8 *Weigh Bridge Ahead*

The sign is used to indicate the drivers of trucks or heavy goods vehicles the location of weigh bridge station. The distance or direction arrow may be included below the text This is provided in advance of the facility so that driver can reduce the speed and leave the highway safely **(Fig. 16.09).**

16.3.9 *Gantry Mounted Signs*

The gantry mounted signs are made for different situations. These are made for both lane specific and non-lane specific directions and can include more than one destination on the same line. Further, the first gantry may include junction name panel at the top of the gantry assembly.

Fig. 16.10 presents a design for gantry mounted direction boards to be placed ahead of a traffic diverging point on main highway where grade separated movement has been facilitated for main highway traffic.

Fig. 16.11 presents a design for gantry mounted direction boards to be placed ahead of an at-grade junction where right turning movement has been facilitated by a priority or signal controlled junction. The sign may be appropriately redesigned by removing the directional arrows to show all forward destinations to function as a reassurance sign.

Fig. 16.12 presents a design for gantry mounted or shoulder mounted direction boards to be placed far ahead of traffic diverging point on full access controlled and grade separated highway like expressway.

Fig. 16.13 presents a design for lane specific gantry signs where dedicated lanes have been made for destinations mentioned in the gantry boards.

Fig. 16.16 presents a design for gantry mounted signs in urban or city road ahead of a flyover where at-grade movement has been facilitated below the flyover for right turning traffic.

16.3.10 *Tourism Related Signs*

It is recommended to install directional signs for tourist attractions as a separate system subordinate to the primary directional signing system which takes priority. At the same time, signs for tourist attractions should only be installed where their usefulness is undeniable. Care need to be exercised that their importance must not be lessened and the attention of road users must not be distracted by the presence of too many signs. In this regard, tourism development plans should cover road signs to allow domestic and foreign visitors to receive information on the location of sites or attractions and/or how to reach them by providing unique tourism related signs. It is advisable to digitally print the Tourism related Road signs so as to achieve best

resolution and clarity. To address the above, the provision of directional signing for such tourist attractions can be broadly categorized under the following:

- Tourist destination directional signs, with or without photographs (refer **Fig. 16.18 and 16.19**)
- Finger type way finding signs for Pedestrians- Pedestrian friendly signages (refer **Fig. 16.20**)
- Map boards at rest areas or at pedestrian precincts (refer **Fig. 16.21**)
- Facility information signs related to the tourist location with their pictures.

The following practices shall be practiced during the provision of tourist signing:

- ✓ Development of a hierarchy of tourist attractions and strict rules for selection.
- ✓ Harmonization of signs.
- ✓ Use of brown and white colour format by following the dimensions given in **Table 12.1**.
- ✓ On primary roads or access-controlled roads, tourist directional signs to be primarily provided as map type, stack type signs or supplementary sign (either of the applicable ones) on the roadside/shoulder side only.
- ✓ Advance direction signs for tourist attractions are always required for high speed roads.

16.3.10.1 Tourist Place/City Identification Boundary Signs

This sign can be used on all types of roads to mark entrance to the place or city of tourism importance. It should be erected at the entrance to the area under the jurisdiction of the local authority. Administrative boundaries can be marked with the help of boundary signs which shall incorporate photographic or other images showing an item of local interest as shown in **Fig. 16.22**. Similar signs can be posted on approach roads to the Tourist destination by indicating the name of the tourist location/monument as indicated in **Fig. 16.23.**

Whenever such signing is proposed, careful consideration should be given to what can be instantly recognizable from a moving vehicle. Therefore, consideration should also be given to how the image performs in all lighting conditions. More effective images are likely to be those depicting landmarks, buildings or structures that are synonymous with the area, city or town. Photographs showing features such as landmark monument are more likely to create an instant association with a particular place as shown in **Fig. 16.22**.

17. FACILITY INFORMATION SIGNS

The signs illustrated in this section give information to the road user regarding location and availability of services in the vicinity.

17.1 Size, Shape and Colour

These signs shall be rectangular and have a blue background, while black symbol shall be displayed in a white square to indicate the facility. The size of the normal sign (Width x Height)

shall be 600 mm x 800 mm and of the small sized sign 450 mm x 600 mm. Size of the symbol shall be as shown in the **Fig. 17.01**. On the blue band at the bottom of the sign, the distance to the facility indicated or to entry of the road leading to it, may be inscribed in white. The signs may also be set up at the entry to the road leading to the facility and may then bear a white directional arrow on the blue part at the bottom. For Expressways, the size shall be 900 mm x 1200 mm.

17.2 Eating Place

The sign should be used to indicate where a regular eating place is located **(Fig. 17.01)**.

17.3 Light Refreshments

The sign should be used to indicate a place where light refreshments would be available **(Fig. 17.02)**.

17.4 Resting Place

The sign should be used to indicate place where facilities for resting and lodging would be available. It shall be combined with a separate definition plate, indicating whether the place is a Rest House, Motel, Hotel, etc. **(Fig. 17.03)**.

17.5 First Aid Post

The sign should be used to notify the drivers of vehicles on long stretches of roads in rural areas of the first aid facility which may be helpful in case of emergency **(Fig. 17.04)**.

17.6 Toilet

The sign shall be used to inform the vehicles about Toilet facilities. The sign shall be placed at the beginning of such facilities **(Fig. 17.05).**

17.7 Filling Station (Fuel Pump)

The sign should be erected on long stretches of roads in rural and urban areas at the entry to the road leading to the facility including CNG filling stations. It is not necessary when the facility is within sight and available at reasonably frequent intervals along the route **(Fig. 17.06)**.

17.8 Hospital

The sign should be used to notify drivers of vehicles that they should take the precautions required near medical establishments and in particular that they should not make any unnecessary noise. The sign also serves to indicate the location of hospital where medical facilities will be available. **(Fig. 17.07)**

17.9 Emergency SOS Telephone Facility

This sign shall be used at regular intervals in rural highways and in tunnel roads where emergency phones are installed (**Fig. 17.08**)

17.10 U-Turn Facility

This sign shall be positioned on the median exactly at the location where U-turn facility is provided (**Fig. 17.09**). This sign shall be preceded by the placement of 'U- turn Warning Sign' on the median placed between 80 to 100 m before the median opening.

17.11 Pedestrian Subway

This sign is to be used to guide the pedestrian traffic to the Subway. The plate shall contain direction arrow below the text for providing directions to the Subway **(Fig. 17.10).**

17.12 Foot Over Bridge

It is used to inform pedestrians about the location of pedestrian Foot Over Bridge (FOB). Signs are erected at both sides of the carriageway at least 20 m before FOB for traffic approaching from both directions of travel **(Fig. 17.11).**

17.13 Chair Lift

The sign shall be used to inform the vehicles about Chair Lift facility. The sign shall be placed at the beginning of such facility **(Fig. 17.12).**

17.14 Police Station

The sign should be erected at the places where the Police Station is situated nearby **(Fig. 17.13).**

17.15 Repair Facilities

The sign should be erected at the places where the repair facilities are available. **(Fig. 17.14).**

17.16 Railway Station/Metro Station/Monorail Station

The sign should be erected at the places where the Railway Station/Metro Station or any other mass transit station is situated nearby **(Fig. 17.15).**

17.17 Public Bicycle Sharing Stand

The sign shall be used to inform the presence of the public bike sharing stands available **(Fig. 17.16).**

17.18 Cycle-Rickshaw Stand

The sign is to be erected where the cycle-rickshaws are to wait **(Fig. 17.17).**

17.19 Taxi Stand

The sign is to be erected where the taxis are expected to wait when not engaged/hired **(Fig. 17.18).**

17.20 Auto-Rickshaw Stand

The sign is to be erected where the auto-rickshaws are to wait **(Fig. 17.19).**

17.21 Share Taxi/Auto and other Informal/Intermediate Public Transport Stands

This sign will indicate the location of share taxi/share auto stands **(Fig. 17.20).**

17.22 Home Zone

The sign shall be used to inform the vehicles about home zone, generally useful for traffic calming measures which will entail slowing down to required speed levels as well as no honking. The sign shall be placed at the beginning of such area (This sign can be used in both rural and urban areas) **(Fig. 17.21).**

17.23 Camp Site

The sign shall be used to inform the vehicles about Camp Site. The sign shall be placed at the beginning of such areas **(Fig. 17.22).**

17.24 Airport

The sign should be erected at the places where the Airport is situated nearby **(Fig. 17.23).**

17.25 Golf Course

The sign shall be used to inform the vehicles about Golf Course. The sign shall be placed at the beginning of such facility **(Fig. 17.24).**

17.26 National Heritage

The sign shall be used to inform the vehicles about National Heritage Area. The sign shall be placed at the beginning of such area **(Fig. 17.25).**

17.27 No through Road

The sign should be erected at the entrance to a road from which there is no exit **(Fig. 17.26).**

17.28 No through Side Road

The sign should be erected on the main road, with appropriate variations to the symbol so as to show the road layout, where it is considered essential to give advance indication of a 'No Through' Side Road' **(Fig. 17.27).**

17.29 Toll Road Ahead

This sign shall provide information to all vehicles about Toll roads and shall be installed at the beginning of such road **(Fig. 17.28).**

17.30 Guide Sign for ETC Lane

This sign shall be used to inform vehicle about Guide sign on Toll Lane Portal **(Fig. 17.29).**

17.31 Country Border

The sign shall be used to inform the vehicles about Border of country. The sign shall be placed at the beginning of such location **(Fig. 17.30).**

17.32 Entry Ramp for Expressway

The sign is erected where there is Entry ramp to expressway. **(Fig. 17.31)**. A supplementary board can be provided showing term 'Entry' with entry numbers. Alternatively, these signs shall be placed along with the overhead direction signs indicating the entry numbers also.

17.33 Exit Ramp for Expressway

The sign is erected where there is Exit ramp from expressway **(Fig. 17.32)**. A supplementary board can be provided showing term 'Exit' with exit numbers. Alternatively, these signs shall be placed along with the overhead direction signs indicating the exit numbers as given in **Annexure-V.**

17.34 Expressway Symbol

This sign is erected at the entry of Expressways **(Fig. 17.33).**

17.35 End of Expressway

This sign is erected at the end of Expressway **(Fig. 17.34).**

17.36 Bus Stop

The sign should be erected at the places where the buses are designated to stop **(Fig. 17.35).**

17.37 Bus Lane

This sign is installed to inform the drivers of the presence of reserved bus lane in the carriageway. The operation of bus lane is supported by appropriate markings on the pavement to delineate the lane and indicate the bus only lane markings. These are generally mounted overhead with appropriate support **(Fig. 17.36).**

17.38 Contra Flow Bus Lane

This sign is installed to indicate the presence of bus lane to permit the operation of buses in the opposing direction of flow on one-way streets **(Fig. 17.37).**

17.39 Cycle Lane

This sign provides information about Cycle Lane to road users **(Fig. 7.38).**

17.40 Contra Flow Cycle Lane

This sign shall be used to inform the vehicles about Contra flow of Cycles and shall be installed before beginning of such lane **(Fig. 17.39).**

17.41 Holiday Chalets

The sign shall be used to inform the vehicles about Holiday Chalets. The sign shall be placed at

the beginning of such areas **(Fig. 17.40).**

17.42 Emergency Exit in Tunnel

The sign shall be used to inform people about emergency exit. The sign shall be placed at such areas as tunnel etc. **(Fig. 17.41** and **17.42).**

17.43 Emergency Helpline Number

Emergency Helpline numbers can be posted at every 5 km interval. In the case of divided carriageways, such boards shall be clubbed together and posted for both directions of travel using a single foundation in one support. Considering the content designed in the board, 1.2 m x 0.9 m board size can be used and a typical example has been presented (**Fig. 17.43**).

17.44 Emergency Lay By

The sign shall be placed near the lay-bys enabling parking outside of the carriageway in the case of emergency especially near tunnels, expressways and elevated corridors (**Fig. 17.44**).

17.45 Fire Extinguisher

This sign shall be used near the fire extinguisher kept in Tunnels **(Fig. 17.45)**.

17.46 Rest and Service Area Signs

This sign shall be used near Toll Plazas for pictorial illustration of various facilities like Toilets, kiosks for sale of refreshments, Water and ATM **(Fig. 17.46).**

17.47 Pedestrian Crossing Information Signs

This sign shall be used at critical pedestrian crossing locations to inform the road users about exact location of pedestrian crossing **(Fig. 17.47)**. This sign shall be preceded by the placement of 'Pedestrian Crossing Warning Sign'.

17.48 Speed Hump/Speed Table Information Signs

This sign shall be installed at the speed breakers/speed table location to inform the road users about its exact location **(Fig. 17.48)**. This sign shall be preceded by the placement of 'Speed Breaker Warning Sign'.

17.49 Electric Vehicle Charging Station

This sign shall be installed near locations where Electric Vehicle Charging facilities are provided **(Fig. 17.49)**.

18. PARKING INFORMATION SIGNS AND FLOOD GAUGE

18.1 The shape and colour of these signs shall be the same as those of 'Facility Information'

signs. The symbols shall be according to the drawings shown in respective sign.

18.2 Parking Signs

The parking sign, which may be set up parallel to the axis of the road, should indicate the places where parking of vehicles is authorized. The sign shall be square of 600 mm x 600 mm size and parking sign with vehicular type shall be of size 600 mm x 800 mm. It shall bear the letter '**P**' in white colour. The background colour shall be blue with white border **(Fig. 18.01).** Symbols or inscriptions on an additional plate below the sign may show the direction in which the parking places lie or the categories of vehicles for which parking is reserved.

18.3 Auto Rickshaw Parking

This sign will indicate Auto Rickshaw Parking **(Fig. 18.02).**

18.4 Cycle Parking

This sign will indicate Cycle Parking **(Fig. 18.03).**

18.5 Cycle Rickshaw Parking

This sign will indicate Cycle Rickshaw Parking **(Fig. 18.04).**

18.6 Scooter and Motorcycle Parking

This sign will indicate Scooter & Motorcycle Parking **(Fig. 18.05).**

18.7 Taxi/Car Parking

This sign will indicate Taxi/Car Parking (**Fig. 18.06** and **18.06a**).

18.8 Park and Ride

The sign is to be erected where the parking is allowed only for riding the public transport vehicle **(Fig. 18.07 and 18.08).**

18.9 Pickup and Drop Point

This sign shall be erected near dedicated pickup and drop points for private vehicles, taxis, auto rickshaws and other Intermediate Public Transport (**Fig. 18.09**).

18.10 Parking Restrictions Signs for Traffic Management

The sign is to be erected where the parking is not allowed for specified durations for traffic management **(Fig. 18.10).**

18.11 Flood Gauge Sign

The sign should be installed at causeways and submersible bridges or culverts to indicate to the road users the height of the flood above the road level **(Fig. 18.11).**

19. SIGNS FOR DIFFERENTLY ABLED PERSONS

19.1 The International Symbol of Accessibility

The International Symbol of Accessibility (ISA) is also known as the International Wheelchair Symbol. It is used as informatory sign with blue background and image of a person using a wheelchair overlaid in white. The wheelchair figure should always be seen facing right **(Fig. 19.01).**

19.2 Size, Shape and Colour

These signs shall be rectangular and have a blue background, while white symbol shall be displayed to indicate the facility. The size of the normal sign shall be 600 mm x 600 mm and the symbol shall be as shown in **Fig. 19.01**.

19.3 Parking Information

The parking area should be indicated using a signage to reserved vehicle parking for users with disabilities. Since the wheelchair is always to be shown facing right, the direction of the parking should be indicated using an arrow **(Fig. 19.02 and 19.03).**

19.4 Ramped Entrance to Subway/Over Bridge

These signs shall inform the persons with disabilities about the ramp facility to enter subway/ over bridge. These signs shall be rectangular and have a blue background, while white symbol shall be displayed to indicate the facility **(Fig. 19.04).**

19.5 Toilet Facility

The Toilet area should be indicated using a signage for a person with disabilities **(Fig. 19.05).**

19.6 Way Finding Sign for Disabled

The Way finding sign should be indicated using a signage for a disabled person **(Fig. 19.06).**

20. ENFORCEMENT RELATED SIGNS

20.1 These signs are used where a particular enforcement measure is to be actively followed by the traffic.

20.2 Surveillance Cameras

The signs given under this section are to be installed at locations were a surveillance camera is present for enforcement related purpose.

20.2.1 *Red Light Violation Detection (RLVD) System Surveillance Camera*

The sign is to be installed near traffic signals where there is active RLVD system to warn and inform the road users about its presence.

Most of the road crashes associated with signalized intersections is due to the violation of Red

Light. A sign shall be provided with the information on the possible penalty on red light violation and 'STOP' line violation as per the adoption of the prevailing Motor Vehicle act in the respective states. Red light violation penalty information shall be given along with the traffic signal or it shall be shoulder mounted near to the signal. Typical design for the sign boards is shown in **Fig. 20.01**.

20.2.2 *STOP Sign Violation*

Many road crashes occur as a result of violation of the STOP sign. Further, the STOP signs shall be supplemented by informatory boards showing the details of penalty implemented in the respective states for violating the STOP sign **(Fig. 20.02)** as per the prevailing Motor Vehicle act.

20.2.3 *Speed Camera*

This sign is to be installed at regular intervals along roads which have speed detection cameras installed (**Fig. 20.03**). Speed enforcement should be highly visible, with drivers made fully aware of the presence of cameras and of the prevailing speed limit. The camera and speed limit signs should always be clearly visible to drivers and not obscured by other street furniture or vegetation. Speed limit repeaters and camera signs should be co-located where permitted and practicable.

20.3 Lane Discipline Information Sign

Vehicle Category wise and speed wise lane dedication information signs are to be installed on high speed corridors preferably as overhead signs (**Fig. 20.04**). Heavy vehicle drivers are to be informed to use the left most lane with shoulder mounted signs as well (**Fig. 20.04a**).

20.4 Tow Away Zones

Tow away zones where parking is strictly prohibited shall be provided with informatory signs as shown in **Fig. 20.05**.

20.5 Lane Priority Signs for Emergency Vehicles

Signs for Emergency priority lanes shall be provided to guide the road users to give way to emergency vehicles like ambulances **(Fig. 20.06).**

21. VARIABLE MESSAGE SIGNS

21.1 Variable Message Signs (VMS) are electronic traffic signs often used on roadways to give travellers information about current travel conditions, special events, etc. Such signs warn the road users of traffic congestion, road crashes, incidents, roadwork zones, or speed limits on a specific highway segment. The use of VMS boards which are constantly updated based on the prevailing traffic conditions from Traffic Management Centre (TMC) can suggest the road users to take alternative routes, limit travel speed, warn of location of the incidents or just inform of the traffic conditions. A common technology used in new installations for variable message signs are LED displays. In recent years, some newer LED variable message signs have emerged

which has the ability to display coloured text and graphics. They are commonly installed on an overhead gantry structure or a cantilever structure. It is fully-programmable, customizable solution specific to the location for the benefit of users. The information displayed is real-time dynamic information as well as static information controlled automatically via a central server and hence can be regarded as Smart Variable Message (VMS). It is designed to affect motorist's behaviour to improve traffic flow and enhance the driving experience of motorists on roads. The information displayed include:

- Live travel time between destinations
- Live traffic congestion
- Weather updates
- Alternate routes
- Pollution data
- Variable speed limits
- Event notice and motorist instructions
- Crash updates
- Incident management via Emergency messages
- Directional signs
- Traffic Do's and Don'ts
- Warning/Public messages etc.

These Smart VMS should be able to draw information from cloud-based services as well as able to integrate with local road/ground based sensors to provide useful information to the motorists. These VMS should be able to work on standalone basis and show real time information even in the event of a failure at the central server/during emergency situations. Unlike the late 1990s where variable message signs were simply LED display with mostly single colour showing static messages, the present day technology has advanced and now these displays are fill coloured with better resolution, capable of displaying both text and graphics as per IRC:SP:110. Considering these, a VMS shall have a full-colour 10 mm pitch LED display having a brightness of 7500-8000 cd/m^2 with CE, FCC, CB, RoHS, EN12966 (Display Parameters) Certifications for better visibility and readability. These Intelligent VMS boards shall have the facility to switch to Low Power mode screens in case of Mains power failure. Maximum Power consumption per cabinet should not exceed 0.4 kw/m^2. These screens should be monitored remotely for pixel level failure detection via a dashboard at the control room. It shall also provide Android and iOS based application for Disaster Management and Emergency Messages. This solution proposed should support 128-bit encryption along with dongle based access control to ensure secure access and communications with server. Apart from Traffic management system, Variable Message Signs can be used at bus stops to display the live journey time of buses, can be integrated with other ITS solutions to give driver feedback, ensure driver safety and enforce traffic rules. A typical VMS is shown in **Fig. 21.1** which suggests the road users to take alternative routes, limit travel speed, warned of duration and location of the incident and traffic information.

Fig. 21.1 Typical Variable Message Sign Board (VMS)

To get the detailed specifications for various design speeds, background colour, letter size, number of rows of information, pixels, etc. the relevant IRC specifications related to Variable Message Signs namely, IRC:SP:85 and IRC:SP:110 shall be referred.

22. ROUTE MARKER SIGNS

22.1 Route Marker signs are proposed in respect of National Highways, State Highways, Expressways and Asian Highways. The following characteristics for Route Marker Signs are recommended:

i) Uniform shape of route markers for different types of roads.

ii) Colour coded and simple shape with contrasting colours of letters for better recognition.

iii) Prominence given to number of route and colour background for quick grasp by the driver.

22.2 State Highway Route Marker Sign

22.2.1 *Design*

The State Highway Route Marker Sign shall consist of a shield with Retro Reflective Green Colour Base and white symbol and border on a rectangular plate of size 600 mm x 800 mm. The sign consists of State Code (same as vehicle registration) in two letters and the letters 'SH' (State Highway) both with a font size of 100 mm, separated by a horizontal line, followed by the numerals of SH route number with a font height of 180 mm. The shape, size and spacing of letters and numerals shall conform to those given in **Fig. 22.01**.

22.2.2 *Location*

The sign shall be erected on State Highway route prior to the major intersections and immediately after the major intersections as confirmatory Route Markers, at suitable locations through built-

up areas, and at such other point that may be considered necessary to guide through traffic. The distance (along the State Highway) of the sign from the junction, on either side of it shall be 100 to 150 m. Also, it shall be fixed on the left hand side as one approaches the junction.

22.2.3 *Definition Plate*

When the sign is erected in advance of a junction, the direction which the State Highway takes at the junction shall be indicated with an arrow symbol on a definition plate of the size 300 mm by 250 mm fixed below the shield (route marker sign). The background colour of the definition plate shall be the same as of the shield. The border and arrow shall be in white colour.

22.3 National Highway Route Marker Sign

22.3.1 *Design*

The National Highway Route Marker Sign shall consist of a shield with retro reflective yellow colour base and black symbol and border on a rectangular plate of size 600 mm x 800 mm. The symbol consists of letters of 'NH' (National Highway) with a font height of 200 mm and numerals of NH route number with a font height of 180 mm. The shape, size and spacing of letters and numerals shall conform to those given in **Fig. 22.02.**

22.3.2 *Location*

The sign shall be erected on National Highway route prior to the major intersections and immediately after the major intersections as confirmatory Route Markers, at suitable locations through built-up areas, and at such other point that may be considered necessary to guide through traffic. The distance (along the National Highway) of the sign from the junction, on either side of it, shall be 100 to 150 m. Also, it shall be fixed on the left hand side as one approaches the junction.

22.3.3 *Definition Plate*

When the sign is erected in advance of a junction, the direction which the National Highway takes at the junction shall be indicated with an arrow symbol on a definition plate of the size 300 mm by 250 mm fixed below the shield (route marker sign). The background colour of the definition plate shall be the same as of the shield. The border and arrow shall be in black colour.

22.4 Asian Highway Route Marker Sign

22.4.1 *Design*

The Asian Highway Route Marker Sign shall consist of a shield with retro-reflective blue colour base and white symbol and border on a rectangular plate of size 600 mm x 800 mm. The sign consists of the letters 'AH' (Asian Highway) with a font height of 200 mm followed by the number in Arabic numerals assigned to the route with a font height of 180 mm. The shape, size and spacing of letters and numerals shall conform to those given in **Fig. 22.03**.

22.4.2 *Location*

The sign shall be erected on Asian Highway route prior to the major intersections and immediately after the major intersections as confirmatory AH Route Markers, at suitable locations through built-up areas, and at such other point that may be considered necessary to advise the travelers of the presence of the Asian Highways. The distance of these sign posts from the junction along the Asian Highway, on either side of it, shall be 150 to 200 m. Also, it shall be fixed on the left hand side as one approaches the junction. The sign shall be supplemented to the NH, SH or Expressway Route Marker Sign depending upon the category of the road that is classified also as part of the Asian Highway network within the country.

22.4.3 *Definition Plate*

When the sign is erected in advance of a junction interchange, the direction which the Asian Highway takes at the junction/interchange shall be indicated with an arrow symbol on a definition plate of the size 300 mm by 250 mm fixed below the shield (route marker sign). The background colour of the definition plate shall be the same as of the shield. The border and arrow shall be in white colour.

22.5 Expressway Route Marker Sign

The Expressway Route Marker Sign shall consist of a shield with retro-reflective blue colour base and white symbol and border on a rectangular plate of 600 mm x 800 mm. The sign consists of the letters 'NE' (National Expressway) with a font height of 200 mm followed by the number in Arabic numerals assigned to the route with font height of 180 mm. The shape, size and spacing of letters and numerals shall conform to those given in **Fig. 22.04.**

22.5.1 *Location*

The sign shall be erected on Expressway route prior to the major intersections and immediately after the major intersections as confirmatory Route Markers, at suitable locations through built-up areas, and at such other point that may be considered necessary to guide through traffic. The distance (along the Expressways) of the sign from the junction (interchange), on either side of it, shall be 150 to 200 m. Also, it shall be fixed on the left hand side as one approaches the junction (interchange).

22.5.2 *Definition Plate*

When the sign is erected in advance of a junction/interchange, the direction which the National Expressway takes at the junction/interchange shall be indicated with an arrow symbol on a definition plate of the size 300 mm by 250 mm fixed below the shield (route marker sign). The background colour of the definition plate shall be the same as of the shield. The border and arrow shall be in white colour.

23. SIGNS FOR EXPRESSWAYS

23.1 General

An expressway is a divided highway for high speed traffic with full control of access. The signing system for expressways should help road user to get clear and progressive direction information to avoid possible inconvenience by missing proper entry or exit. Apart from the direction information signs, alignment delineation signing and hazard adjacent to high speed traffic are important while considering signing for expressway. As the Vulnerable Road Users (VRU) like pedestrians and cyclist are not allowed on the expressway, the signs related to VRUs are not required in the main alignment.

Signs are designed so that they are legible to road users approaching them and can be read in time to permit proper responses. Desired design characteristics include: (a) long visibility distances, (b) large lettering and symbols, and (c) short legends for quick comprehension.

23.2 Colour of Signs

The colour of all type of signs except direction informatory sign shall be same as given in **Plate-I and Plate-II** whereas for direction information signs, it shall be white lettering, border and arrows on blue background. In case of Facility signs, black symbol is displayed within white square in blue background.

23.3 Format of Legends on Overhead and Shoulder Mounted Signs

The legend on all signboards shall be bilingual - regional/local language and English except on those signboards located at entry and exit points of expressways. Entry/Exit shall have inscriptions in regional/local language, Hindi and English. Bilingual repeater signs having 'Local language and English', 'Hindi and English' can be considered as option. The font type shall be as per **Table 23.1.**

Table 23.1 Font Type for Inscription in Expressway Signs

S. No.	Language	Font Type
1	Hindi	Hindi7 / Narad Bold
2	English	Transport Medium
3	Regional Language	As per local practice

23.4 Warrants for Sign Installation

The siting of regulatory and warning signs shall follow the guidelines mentioned in respective sections. Distances of installation shall be based on the speeds and clear visibility distance as mentioned in **Table 12.1.**

23.5 Sizes of the Signs

Sizes of the signs should be decided based on the design speeds on the type of the roads as shown in **Table 23.2.**

Table 23.2 Sizes of Different Types of Signs on Expressways

Type of Sign	Shape	Size (mm) for Speed 81-100 Kmph	Size (mm) for Speed 101-120 Kmph	Size (mm) for Speed more than 120 Kmph
STOP Sign	Octagonal	1200	1200	1200
GIVE WAY Sign	Triangle	1200	1200	1200
Prohibitory Signs	Circle	900	1200	1500
No Parking and No Stopping, No Standing Signs	Circle	900	1200	1500
Speed Limit and Vehicle Control Signs	Circle	1200	1200	1500
Cautionary Signs	Triangle	1200	1200	1500

23.6 Siting of the Signs with respect to Carriageway

Generally, siting of the signs shall be as per the details given in Section 4.

23.7 Size of Letters

Size of letters should be as per **Table 12.1**. Normally, sign size is determined by the length of the message and size of the letters necessary for proper legibility.

For supplementary plates attached with facility signs, regulatory signs or cautionary signs the recommended letter size shall be as per **Table 12.1**. The text added with some of the regulatory signs for information like timings "9:00 AM to 8:00 PM", dates or days can be in 100 - 125 mm letter size.

23.8 Guidelines for Informatory Signs Installation

General guidelines given in **Sections 1 to 22** as relevant for informatory signs shall apply except for the following signs.

23.8.1 *Direction Signs*

The Direction signs should be either gantry or shoulder mounted. These signs shall be used for grade separated Entry and Exit to the expressways. Advance Direction signs should be placed normally at 500 m, 1 km and at 2 km in advance of the exit.

23.8.2 *Exit Direction Signs*

The Exit Direction sign repeats the route and destination information that was shown on the Advance Information sign(s) for the next exit, and thereby assures road users of the destination

served and indicates whether they exit to the left or right for that destination. Shoulder mounted Exit Direction signs should be installed at the beginning of the deceleration lane. If there is less than 90 m from the beginning of the deceleration lane, the Exit Direction sign should be installed overhead over the exiting lane.

23.8.3 *Distance Signs*

Distances to the same destinations should be shown at 5 km intervals. The distances displayed on these signs should be the actual distance to the destination points and not the distance to the exit from the expressway.

24. SIGNS FOR URBAN AND CITY ROADS

24.1 General

The signing system for urban and city roads should help road user to get clear and unambiguous information where there could be many advertisement hoardings and road side activities. The signs for Vulnerable Road Users (VRU) like pedestrians and cyclists and signs for disabled people would play important role in urban and city road signing.

Signs are designed so that they are legible to road users approaching them and can be read in time to permit proper responses. Desired design characteristics include: (a) long visibility distances, (b) large lettering and symbols, and (c) short legends for quick comprehension.

24.2 Colour of Signs

The colour of all types of signs except direction informatory sign shall be same as given in **Plate-I** and **Plate-II** whereas for direction information signs, it shall be white lettering, border and arrows on blue background. In case of facility signs, black symbol is displayed within white square in blue background.

24.3 Format of Legends on Overhead and Shoulder Mounted Signs

The legend on all signboards shall be bilingual - regional/local language and English except on those signboards located at entry and/exit points of Expressways. Entry/Exit shall have inscriptions in regional/local language, Hindi and English. Bilingual repeater signs having Local language and English, Hindi and English can be considered as option. The font type shall be as per **Table 24.1**.

Table 24.1 Font Type for Inscription in Signs of Urban/City Roads

S. No.	Language	Font Type
1	Hindi	Hindi7 / Narad Bold
2	English	Transport Medium
3	Regional Language	As per local practice

24.4 Warrants for Sign Installation

The placement of regulatory and warning signs shall follow the guidelines mentioned in respective sections. Distances of installation shall be based on the speeds and clear visibility distance as mentioned in **Table 12.1**.

24.5 Sizes of the Signs

Sizes of the signs should be decided based on the design speeds on the type of roads given in **Table 14.1, 14.3, 14.4, 14.6** and **15.1.**

24.6 Siting of the Signs with respect to Carriageway

Generally, placement of the signs shall be as per **Section 4**. Where, however, site condition demand any deviation, the competent authority may decide after due consultation with traffic engineering specialist. In case of space constraints, if the clear siting distance between two successive signs i.e. 0.6*V (where V is the design speed) cannot be provided, the distance can be further reduced up to 20 m. Mounting of two signs on a single post shall also be considered as an alternative.

24.7 Size of Letters

Size of letters should be as per **Table 12.1**. For supplementary plates attached with facility signs, regulatory signs or cautionary signs the recommended letter size shall be as per **Table 12.1**. The text added with some of the regulatory signs for information like timings, dates or days can be in 100 - 125 mm letter size.

24.8 Guidelines for Informatory Signs Installation

General guidelines given in **Sections 1 to 22** as relevant for informatory signs shall be adopted for installation of signs in urban and city roads.

24.8.1 *Direction Signs*

The Direction signs should be either gantry or shoulder mounted. These Advance Direction signs shall be used before intersections or grade separated carriageways/flyovers etc.

24.8.2 *Other Direction Signs and Facility Information Signs*

Signs like Finger type way finding signs for pedestrians, signs for intermediate public transport (IPT) for the pickup and drop zones, signs for mass transport (BRT and Metro), signs to promote multimode public transport, street name signs and also signs for non-motorized transport shall be part of urban signing (Refer **Plate-VI, Fig. 24.01 to 24.03**). Universal accessibility with international symbols to be considered while selecting the signs for Parking, Pedestrian Crossing, Pickup/drop of points, Restrooms etc. As a part of comprehensive footpath design and street and road elements, Way finding and guide map signs for visitors and tourists shall be given. While developing the cycle tracks and pedestrian walkways signs required for it shall

be given. Signs indicating loading and unloading bays for freight vehicles should be placed. Public and mass transit areas shall be provided with clear and consistent way-finding signage to support efficient navigation to public transport stations. This includes static information such as route maps, route destinations and transfer opportunities.

24.8.3 *Gantry Mounted Signs*

Gantry mounted signs given in **Fig. 16.16** are appropriate for locations ahead of a flyover in an urban situation.

25. TOLL PLAZA RELATED SIGNS

25.1 These signs include the informatory signs related to the toll plazas/toll booths. The normal Regulatory STOP sign shall be installed at the boom barrier gates and the bull-nose structures shall be highlighted either with retro reflective sheeting or two-way object hazard markers along with the compulsory pass either side sign. The lane dedicated signs for various categories of vehicles and Fast tag/Cash lanes present at the toll plaza shall be mounted as canopy signs. Advance Lane dedication information for Fast Tag Lanes shall be given along with toll plaza ahead informatory signs (overhead cantilever type) posted at 500 m from toll plaza location. A typical summary of toll plaza related signages are shown in **Plate-VII, Fig. 25.01 to 25.04** and **Annexure-V, Fig. V.13**.

25.2 User Fee Notifications Boards

These include the following boards, which are placed on both approaches of the toll plaza at a slightly off perpendicular alignment.

1) User Fee Information Board - Pictogram
2) User Fee Information Board in English and Local Language
3) User Fee Concession Information Board in English and Local Language
4) Exempted Dignitaries Board in English and Local Language
5) Exempted Vehicles Board in English and Local Languages

In case of National Highways, additional sign boards in Hindi Language shall be provided

The dimensions of the above mentioned sign boards are as follows:

- No. of Lanes = 2/4/6 Lane
- Toll Rate Sign-User fee information sign board
  - Low Speed = 2656 mm x 2474 mm
  - High Speed = 4426 mm x 4123 mm
- Other sign Boards-Concession/Exempted Vehicle Details = 3000 mm x 2000 mm

26. BLACK SPOT RELATED SIGNS

26.1 Crash Prone Area Informatory Sign

Crash Prone Area Informatory signs should be placed ahead of the identified crash-prone location. It shall be in retro-reflective with Type XI fluorescent yellow background with black symbols and numerals as shown in **Fig. 26.1**. Wherever applicable, this sign shall be installed in English, Hindi or any other regional language. The size of small sign shall be 900 mm x 600 mm, medium sign shall be 1200 mm x 900 mm and large sign shall be of size 1800 mm x 1200 mm.

Fig. 26.1 Crash Prone Area Informatory Sign

27. SIGN PLAN EXAMPLES FOR TYPICAL SITUATIONS

Sign plans for some typical situations are presented in **Annexure-V (Fig. V.1** to **V.15)**. The signs shown in these plans are indicative only, and are not the only signs to be used in such road layouts. To cater the specific road environment and road users likely to use these locations, other signs are also required to be installed. Engineer is required to prepare a full sign plan and necessary estimate for implementation. If required, advice of traffic engineering expert may be sought for this.

Fig. V.1 Sign plan for a 3 armed priority junction, primarily showing the direction information and junction control signs.

Fig. V.2 Sign plan for a 4 armed junction, showing the direction information and junction priority.

Fig. V.3 Sign plan for a roundabout indicating the direction information and traffic regulation signs.

Fig. V.4 Sign plan showing the essential signs to be installed when a relatively high speed highway passes through a town/village having vulnerable road users on both sides of highway.

Fig. V.5 Sign plan for a junction with low trafficked road on one side of the highway provided with the speed breaker and signs on the side road.

Fig. V.6 Sign plan for a flyover approach in a non-urban section, mainly giving direction signs for traffic from the main highway, and the direction information for the junction below the flyover.

Fig. V.7a Sign plan for curve delineation in a divided highway showing the positions of chevron signs on curves and the convention to be followed while installing hazard markers.

Fig. V.7b Sign plan for curve delineation in a undivided highway showing the positions of chevron signs on curves and the convention to be followed while installing hazard markers.

Fig. V.8 Sign plan showing guide signs for one of the approaches of a cloverleaf interchange primarily the direction signs and also the gantry signs indicating lane assignment near the exit.

Fig. V.9 Sign plan for a flyover approach in an urban section, mainly direction signs for traffic from the main highway and the direction information for the junction below the flyover.

Fig. V.10 Sign plan for information on Rest and Service Area

Fig. V.11 Sign plan for a School Zone

Fig. V.12 Sign plan for a typical dedicated U-Turn location

Fig. V.13 Toll Plaza Signs

Fig. V.14 Typical sign plan for direction signs for Diamond Interchange

Fig. V.15 Typical sign plan for direction signs for Trumpet Interchange

PLATES (I TO VIII)

STOP and GIVEWAY SIGNS

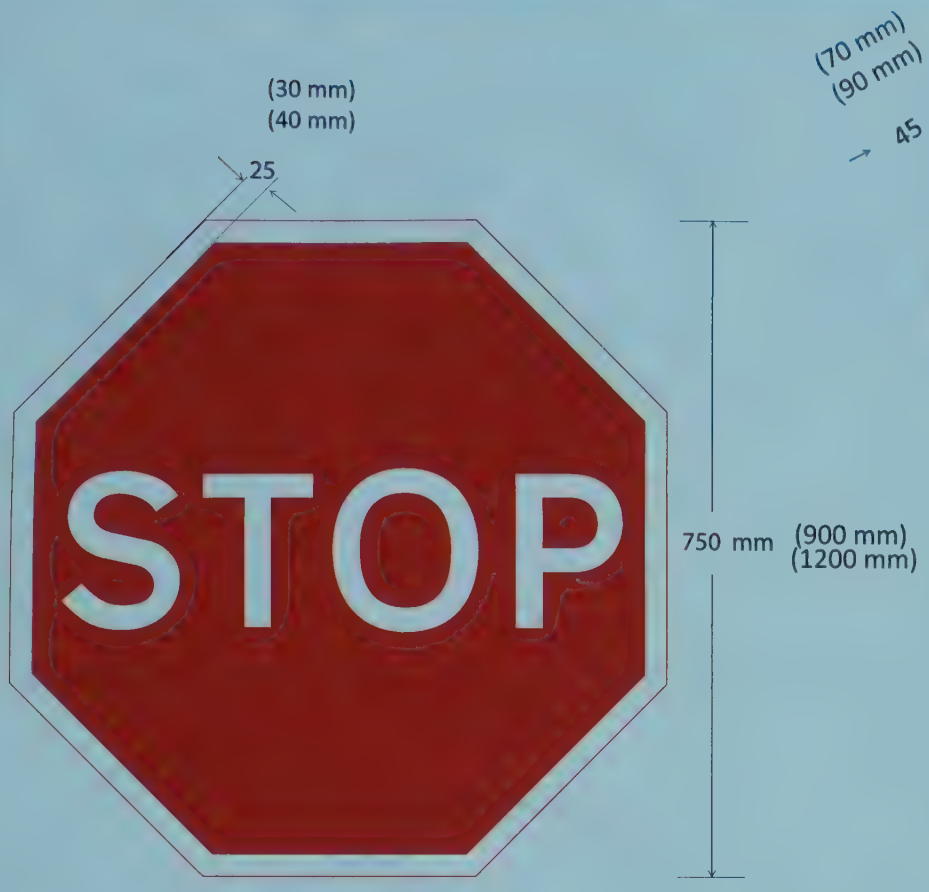


Fig. 14.01 Stop

Fig. 14.02 Give Way

Fig. 14.03 Give Way to Buses Exiting the Bus Bay

PLATE - I (Continued)

PROHIBITORY SIGNS

Fig. 14.04 Bullock Carts Prohibited

Fig. 14.05 Bullock and Hand Carts Prohibited

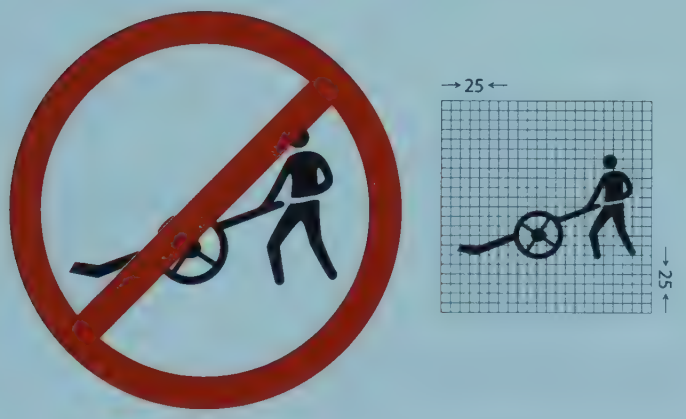


Fig. 14.06 Hand Carts Prohibited

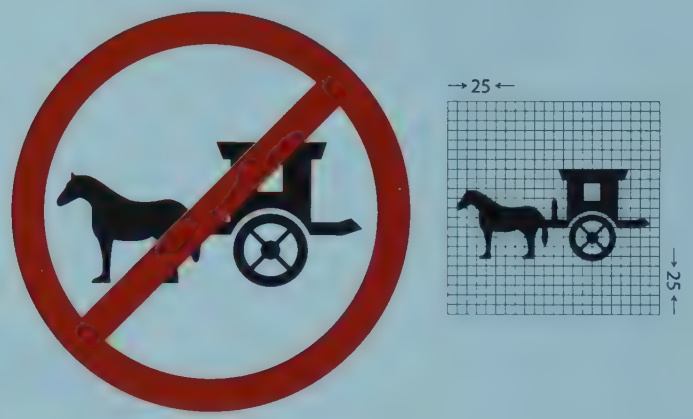


Fig. 14.07 Tongas Prohibited

Fig. 14.08 Horse Riding Prohibited

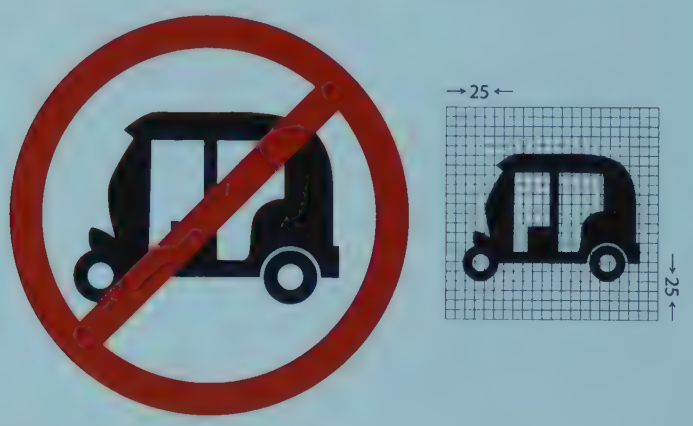


Fig. 14.09 Auto-rickshaw Prohibited

PLATE - I (Continued)

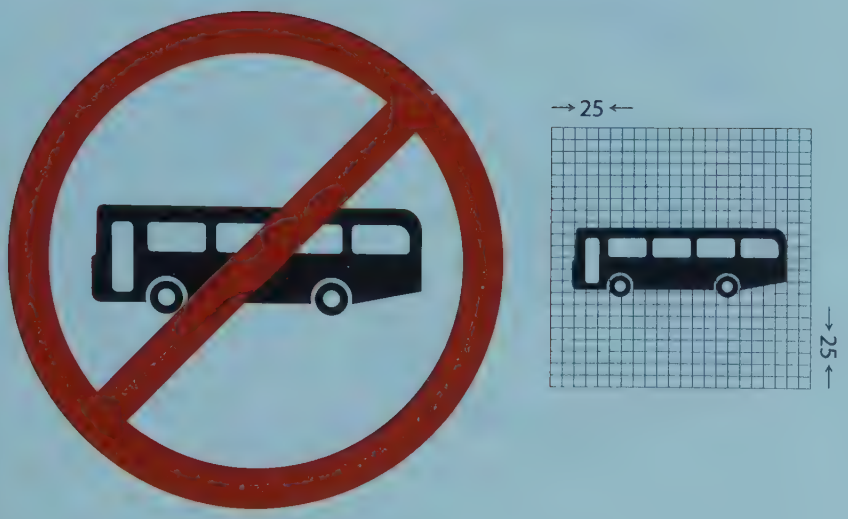


Fig. 14.10 Buses Prohibited

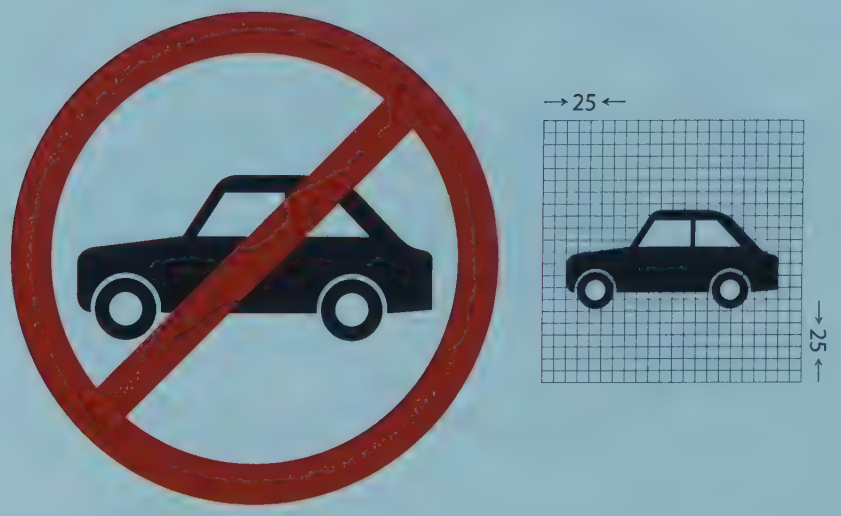


Fig.14.11 Cars Prohibited

Fig. 14.12 Trucks Prohibited

Fig. 14.13 Tractor Prohibited

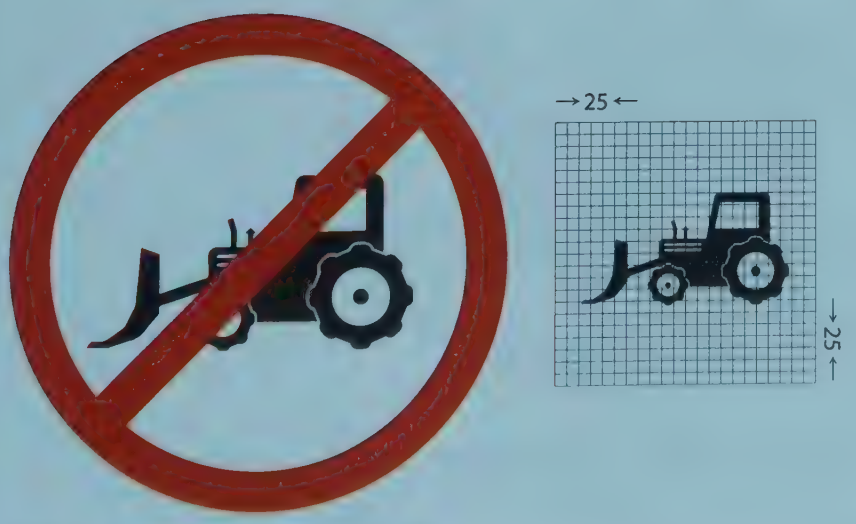


Fig. 14.14 Construction Vehicle Prohibited

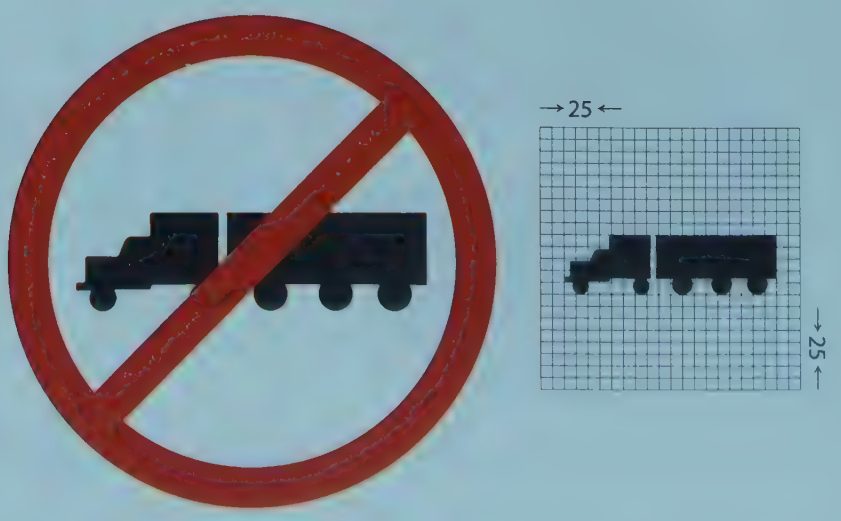


Fig. 14.15 Articulated Vehicles Movement Prohibited

PLATE - I (Continued)

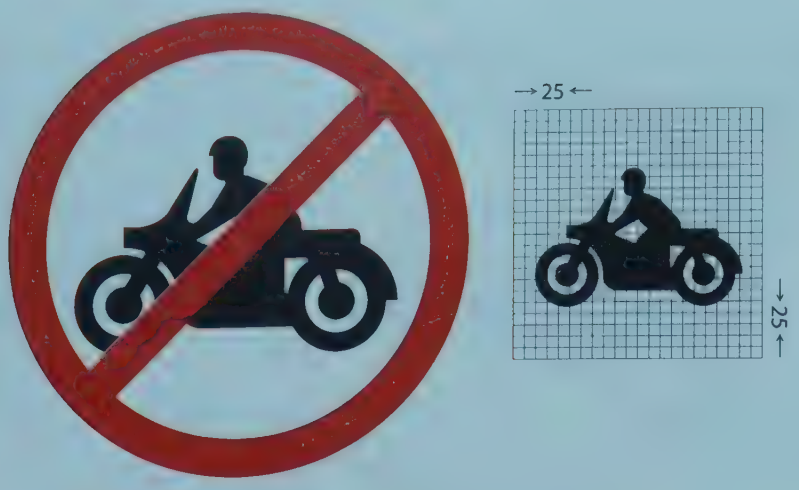


Fig. 14.16 Two Wheeler Prohibited

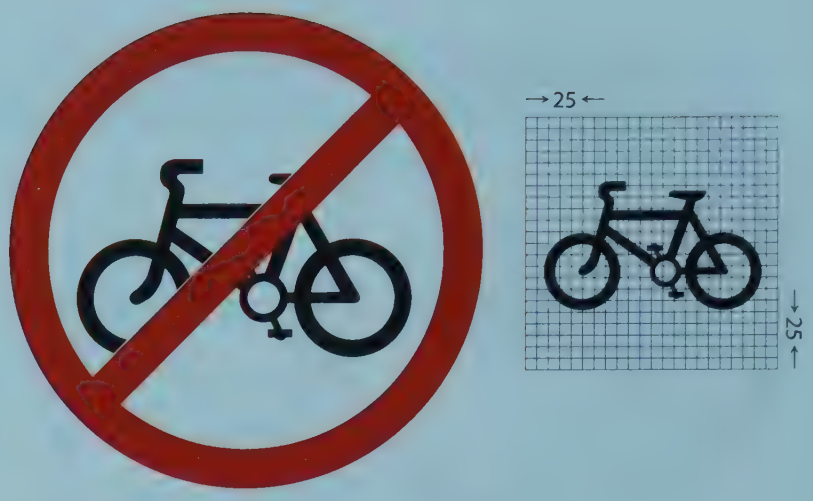


Fig. 14.17 Cycles Prohibited

Fig. 14.18 Pedestrian Prohibited

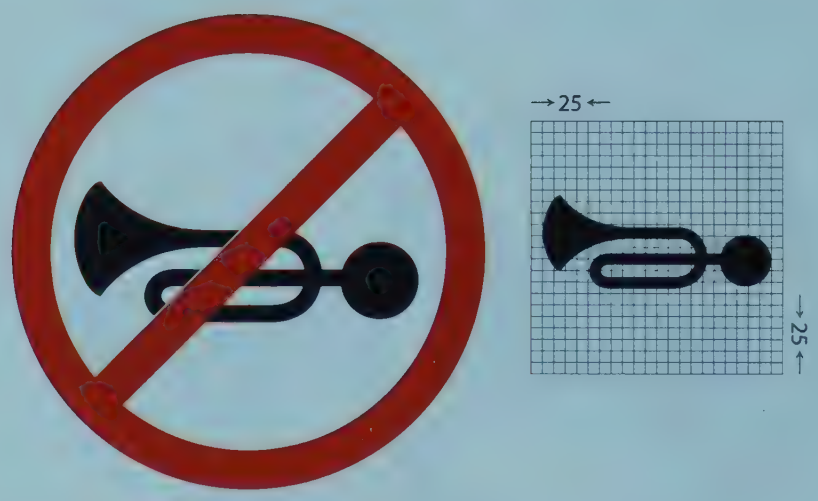


Fig. 14.19 Horn Prohibited

Fig. 14.20 No Entry

Fig. 14.21 One Way

Fig. 14.22 Left Turn Prohibited

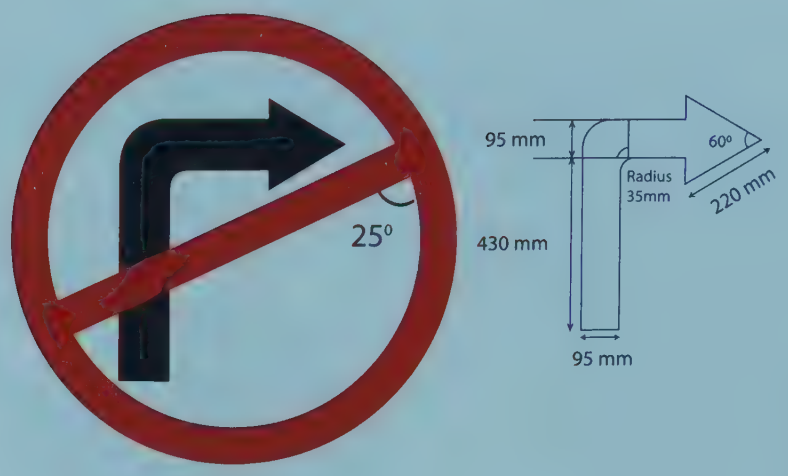


Fig. 14.23 Right Turn Prohibited

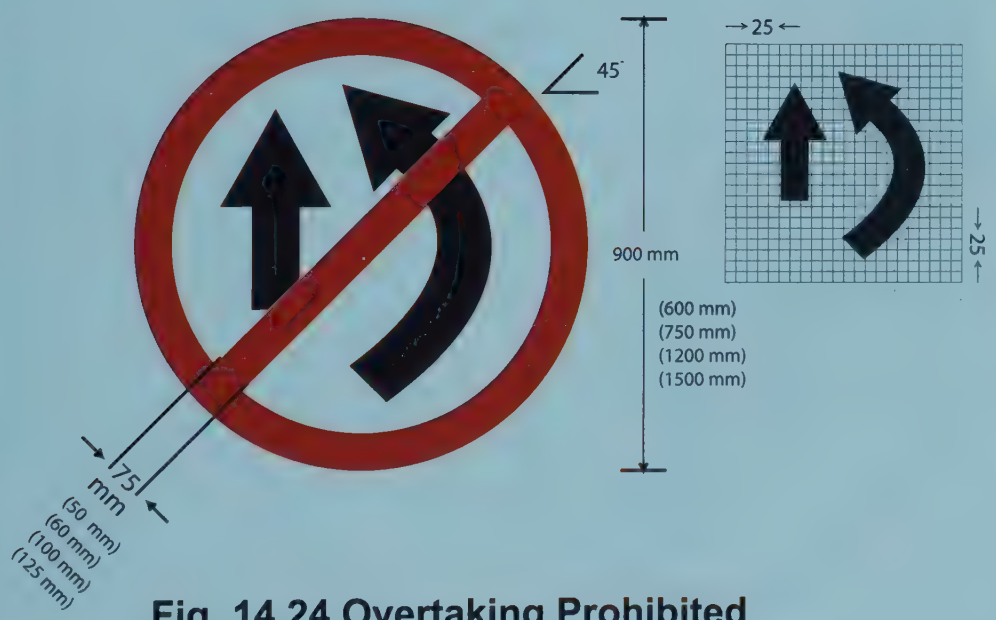


Fig. 14.24 Overtaking Prohibited

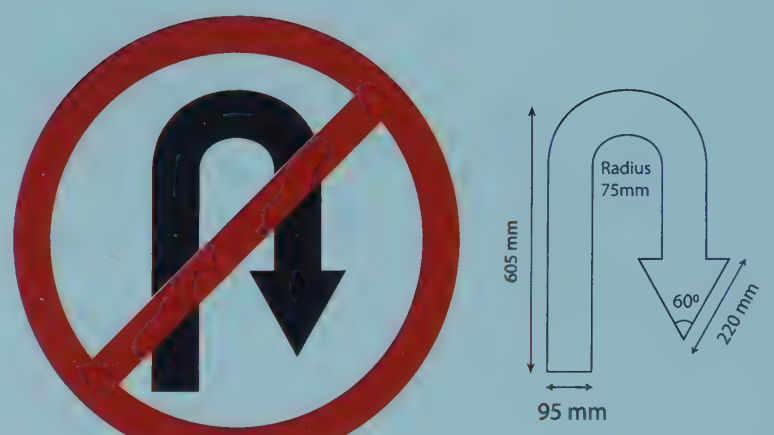


Fig. 14.25 U- Turn Prohibited

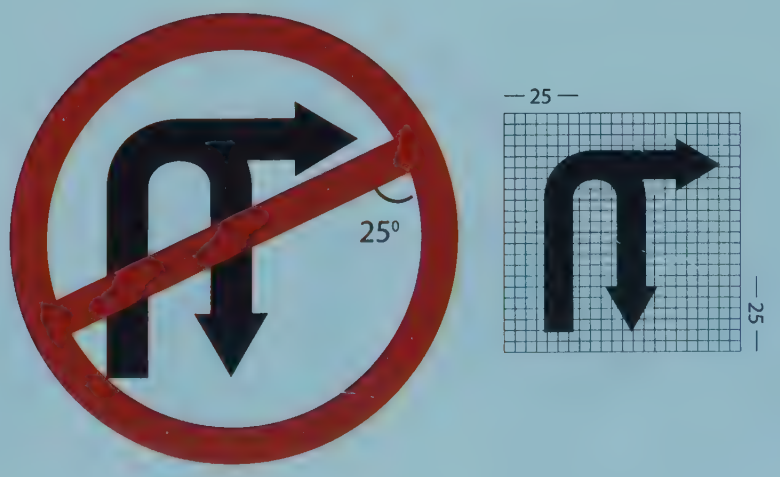
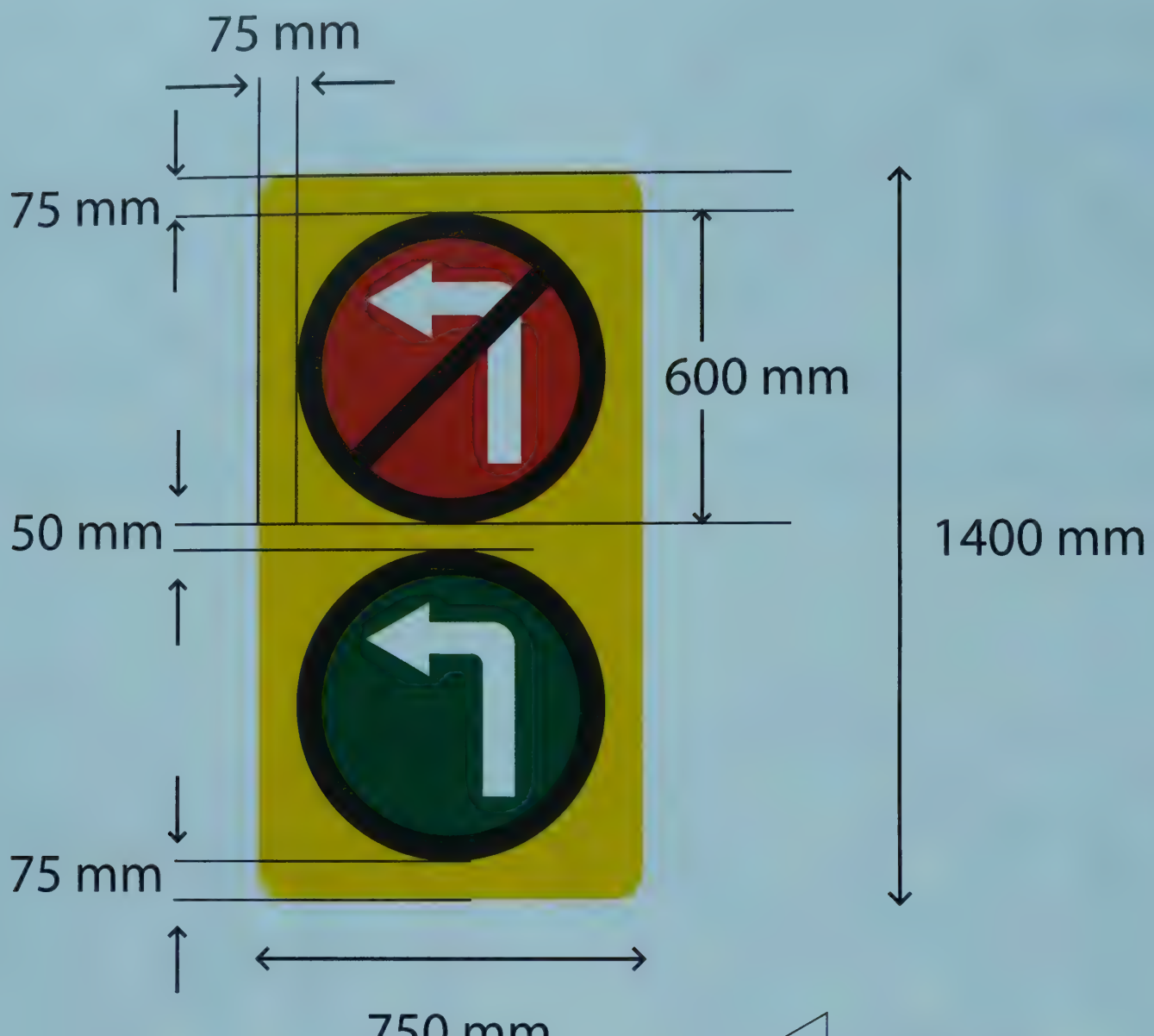


Fig. 14.26 Right Turn & U-Turn Prohibited

PLATE - I (Continued)



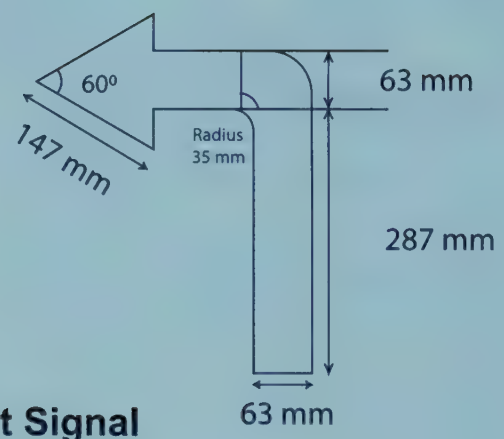


Fig. 14.27 Free Left Turn Prohibited at Signal

Fig. 14.28 Priority to Vehicles from the Opposite Direction

NO PARKING and NO STOPPING SIGNS

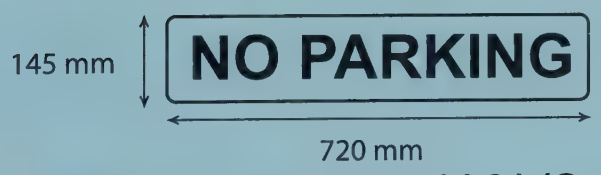
Fig. 14.29 No Standing

Fig. 14.30 No Stopping

Definition Plate to Fig. 14.29 (optional)

Definition Plate to Fig. 14.30

Fig. 14.31 No Parking



Definition Plate to Fig. 14.31 (Optional)

Fig. 14.32 Parking Not Allowed on Footpath

Fig. 14.33 Parking Not Allowed on Half of Footpath

PLATE - I (Continued)

VEHICLE CONTROL SIGNS and SPEED LIMIT

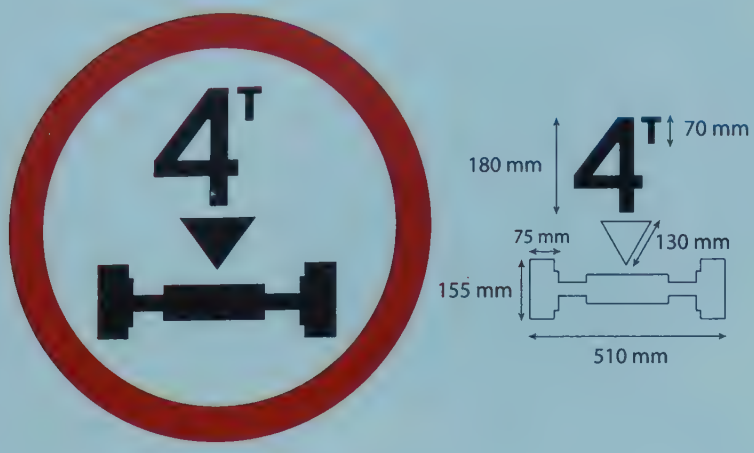


Fig. 14.34 Axle Load Limit

Fig. 14.35 Height Limit

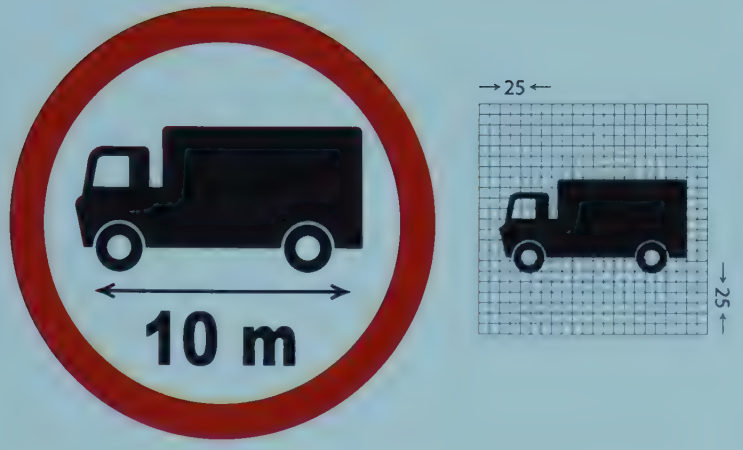


Fig. 14.36 Length Limit

Fig. 14.37 Load Limit

Fig. 14.38 Width Limit

Fig. 14.39 Maximum Speed Limit

PLATE - I (Continued)

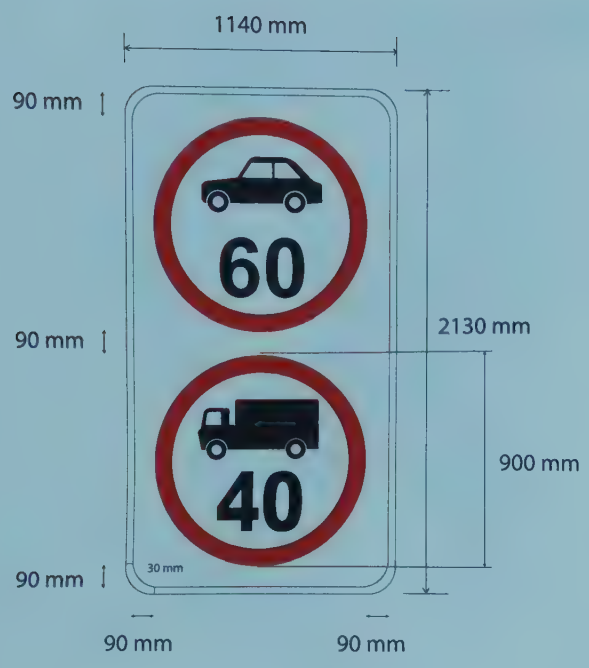


Fig. 14.40a Maximum Speed Limit (Vehicle Type)

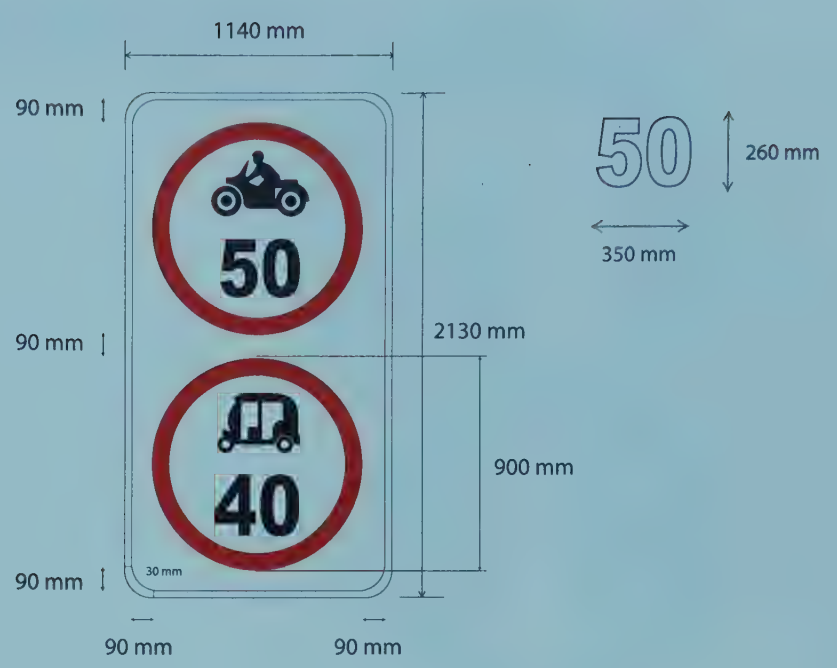


Fig. 14.40b Maximum Speed Limit (Vehicle Type)

Fig. 14.41 Stop for Police Check

RESTRICTION END SIGN

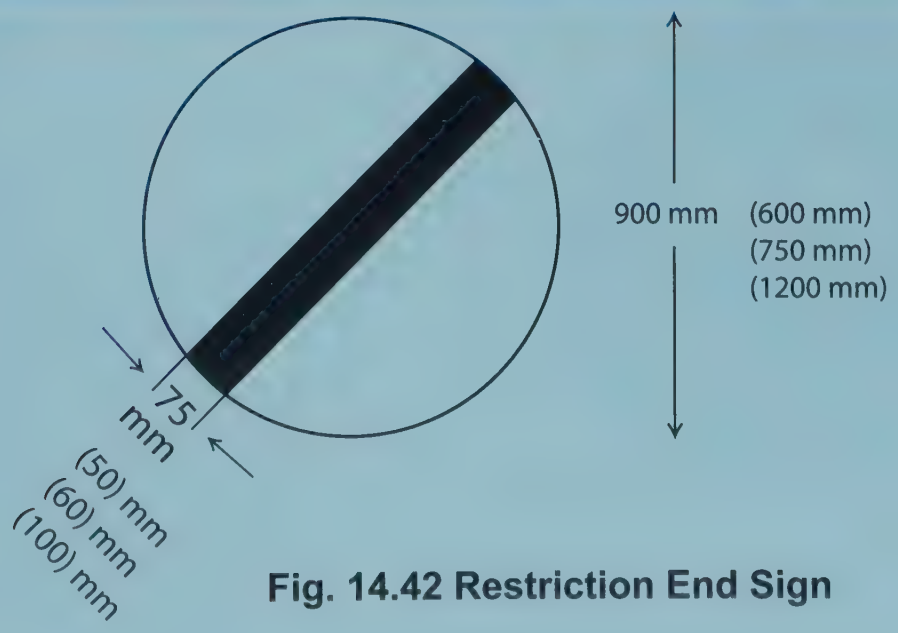


Fig. 14.42 Restriction End Sign

PLATE - I (Continued)

COMPULSORY CONTROL AND OTHER SIGNS

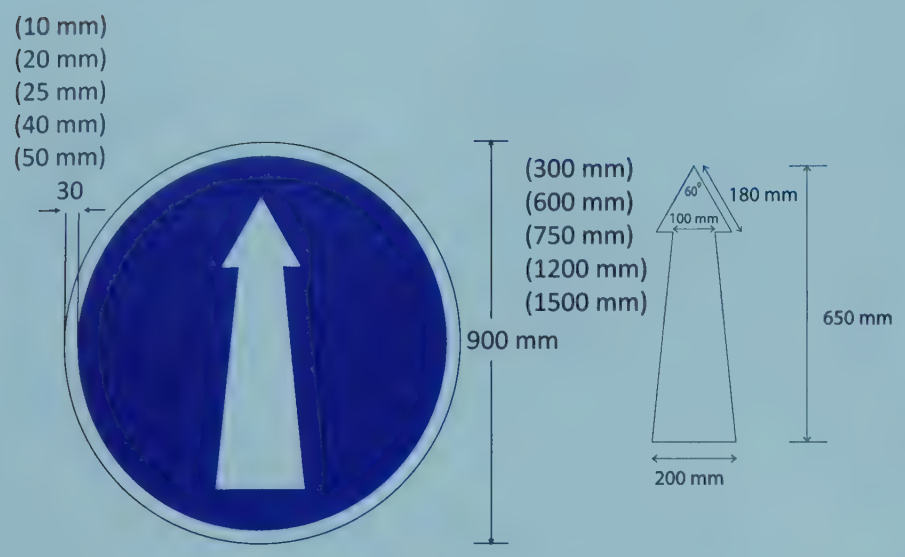


Fig. 14.43 Compulsory Ahead

Fig. 14.44 Compulsory Ahead or Right Turn

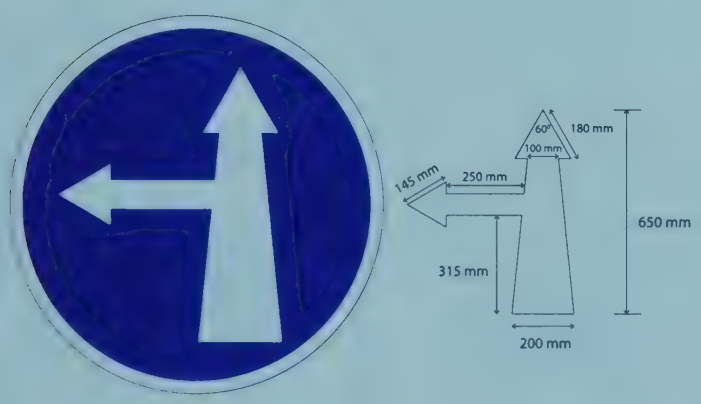


Fig. 14.45 Compulsory Ahead or Left Turn

Fig. 14.46 Compulsory Turn Right

Fig. 14.47 Compulsory Turn Left

Fig. 14.47a Priority to Vehicles from Right

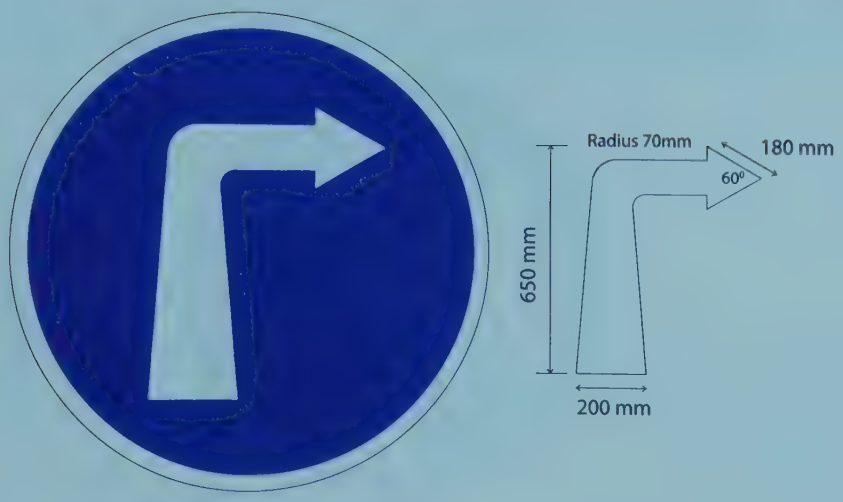


Fig. 14.48 Compulsory Turn Right
(In advance of Junction)

Fig. 14.49 Compulsory Turn Left
(In advance of Junction)

Fig. 14.50 Compulsory Keep Left

Fig. 14.51 Compulsory Keep Right

Fig. 14.52 Pass Either Side

Fig. 14.53 Minimum Speed Limit

PLATE - I (Continued)

Fig. 14.54 Compulsory Cycle Track/Cycle Only

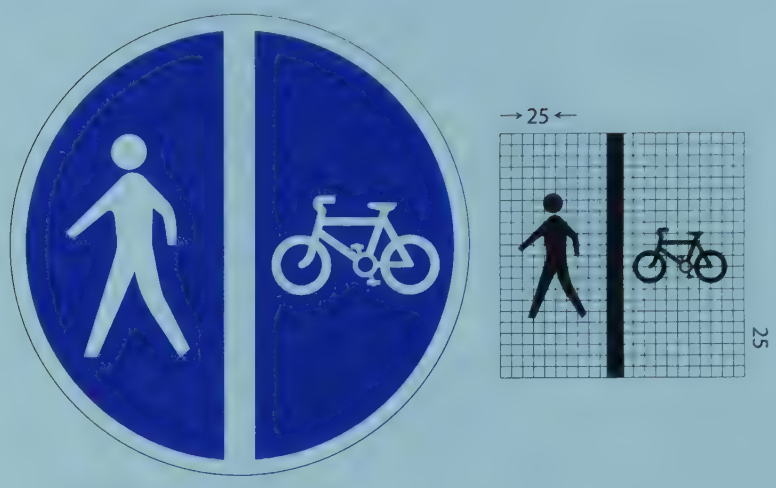


Fig. 14.55 Compulsory Cyclist and Pedestrian Route

Fig. 14.56 Pedestrian Only

Fig. 14.57 Compulsory Snow Chain

Fig. 14.58 Bus Way/Buses Only

Fig. 14.59 Compulsory Sound Horn

CAUTIONARY/ WARNING SIGNS

Fig. 15.01 Left Hand Curve

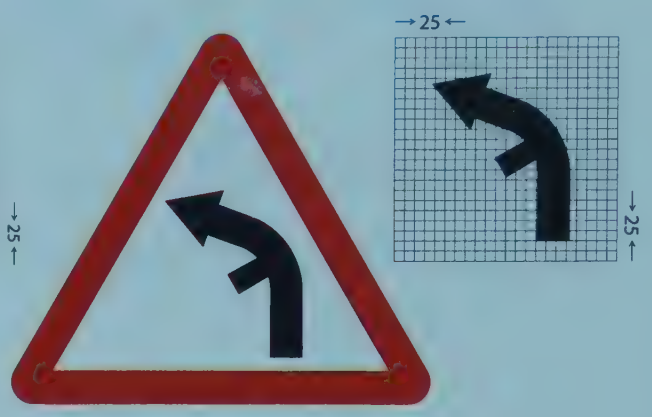


Fig. 15.01a Left Side Road on Left Curve

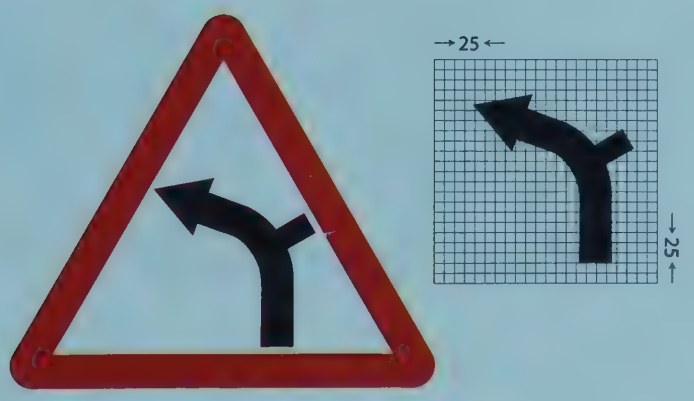


Fig. 15.01b Right Side Road on Left Curve

Fig. 15.01c Cross Road on Left Curve

Fig. 15.01d Staggered Intersection on Left Curve

Fig. 15.02 Right Hand Curve

PLATE - II (Continued)

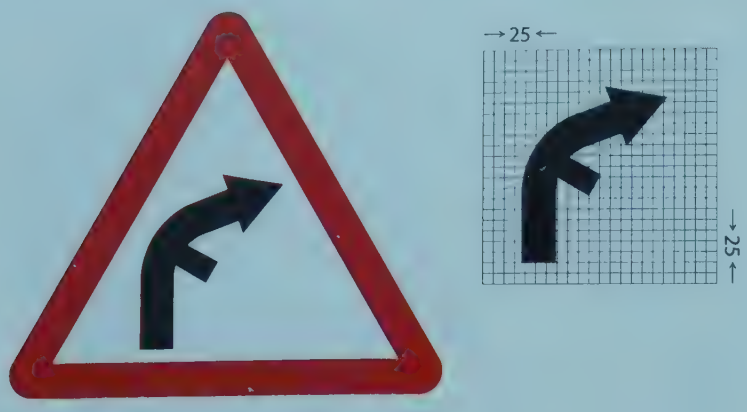


Fig. 15.02a Right Side Road on Right Curve

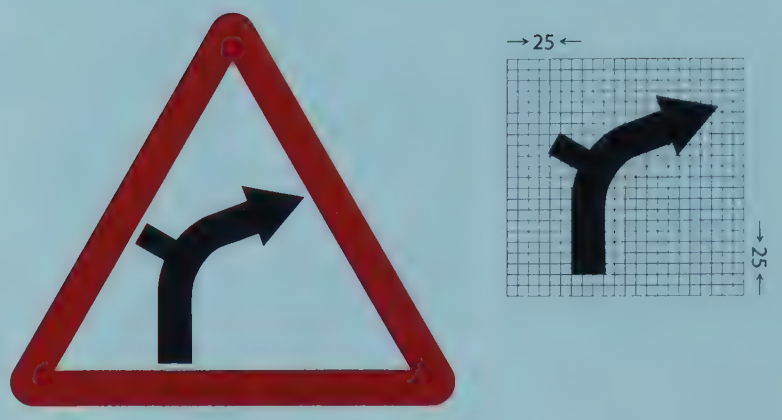


Fig. 15.02b Left Side Road on Right Curve

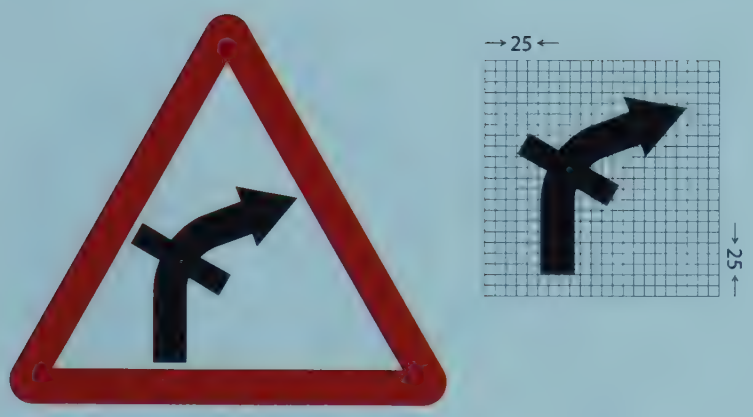


Fig. 15.02c Cross Road on Right Curve

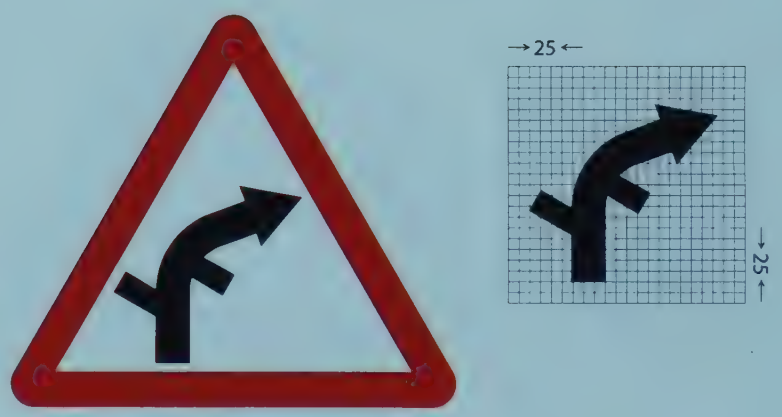


Fig. 15.02d Staggered Intersection on Right Curve

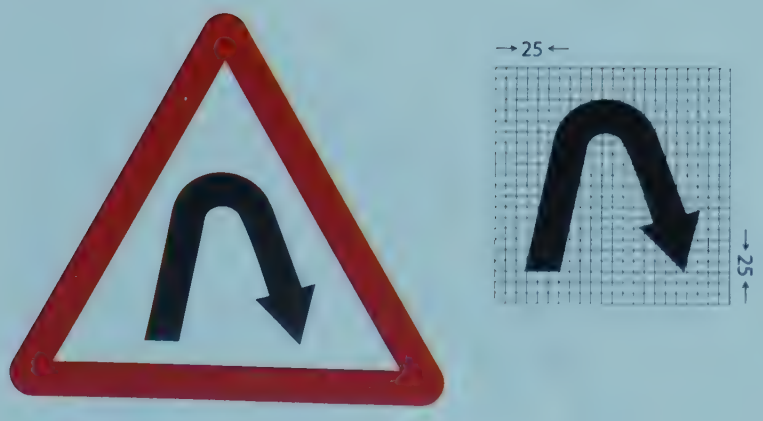


Fig. 15.03 Right Hairpin Bend

Fig. 15.04 Left Hairpin Bend

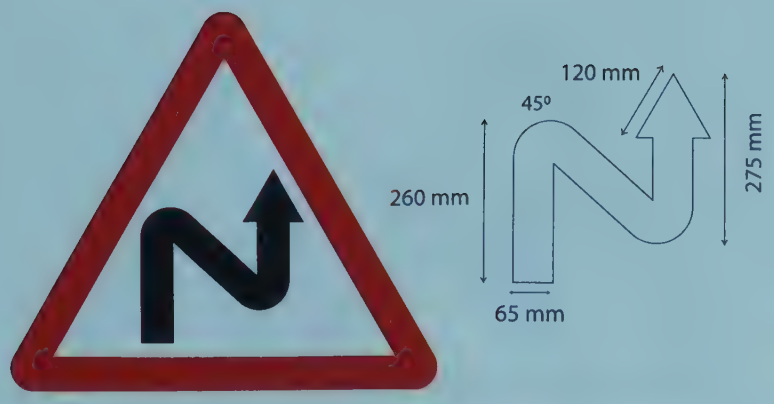


Fig. 15.05 Right Reverse Bend

Fig. 15.06 Left Reverse Bend

Fig. 15.07 Series of Bends

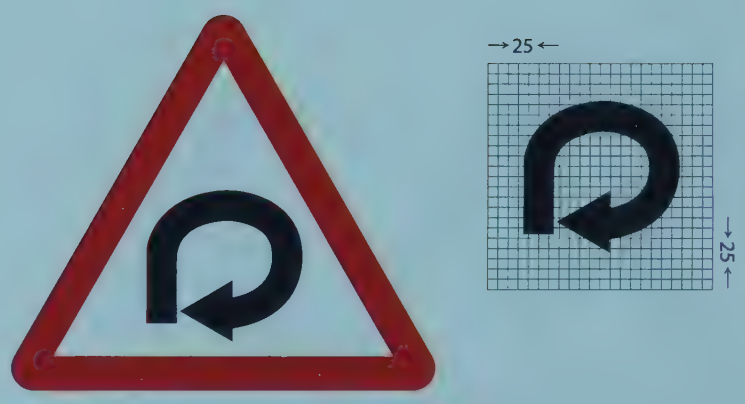


Fig. 15.08 270 Degree Loop

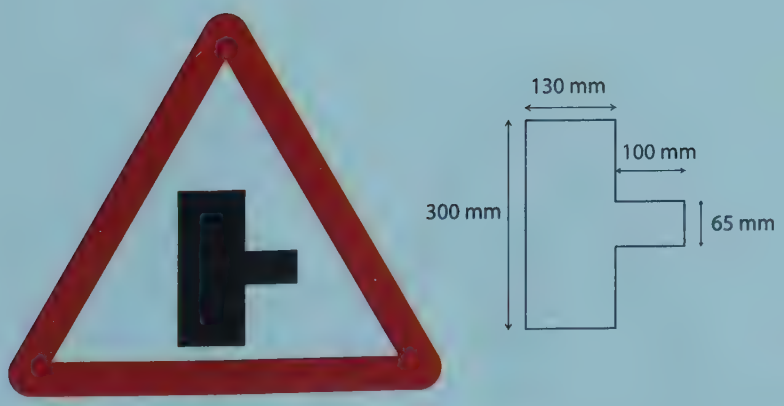


Fig. 15.09 Side Road Right

Fig. 15.10 Side Road Left

PLATE - II (Continued)

Fig. 15.11 Y-Intersection

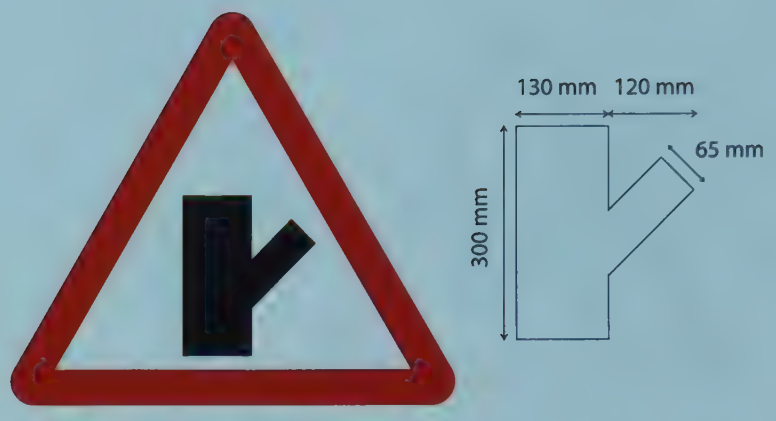


Fig. 15.12 Y-Intersection

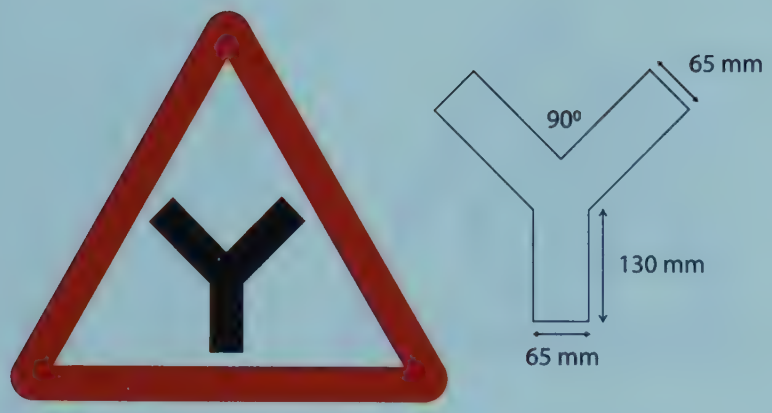


Fig. 15.13 Y-Intersection

Fig. 15.14 Cross Roads

Fig. 15.15 Roundabout

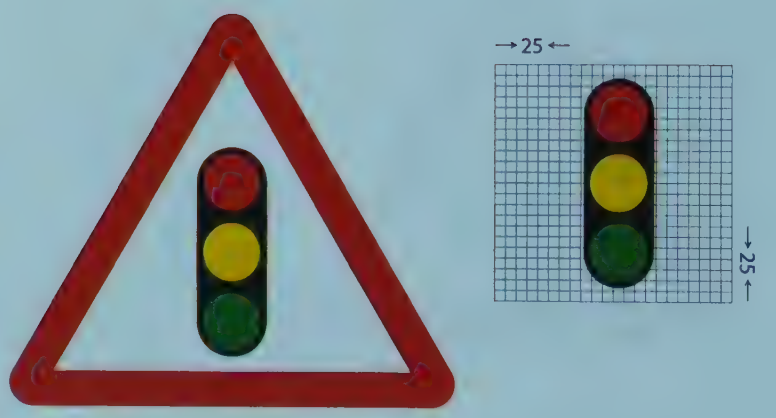


Fig. 15.16 Traffic Signals

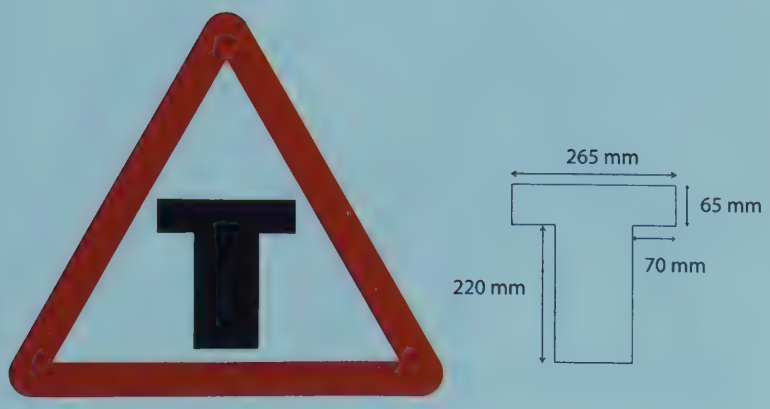


Fig. 15.17 T-Intersection

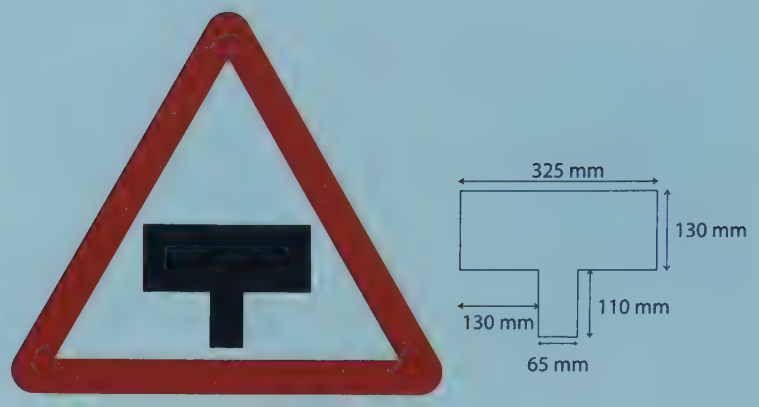


Fig. 15.18 T-Intersection Major Road Ahead

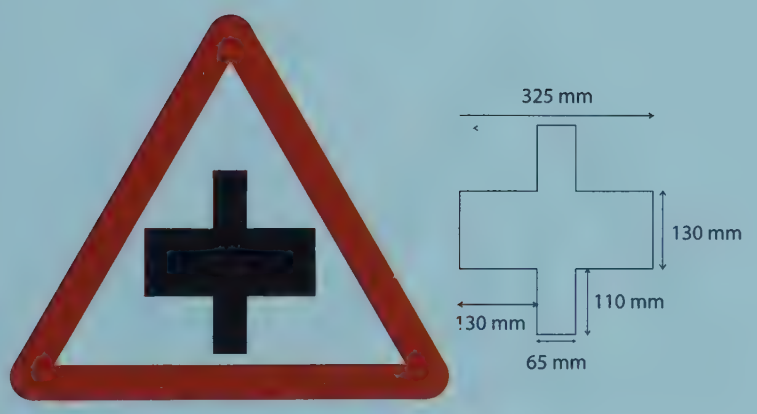


Fig. 15.19 Major Road Ahead

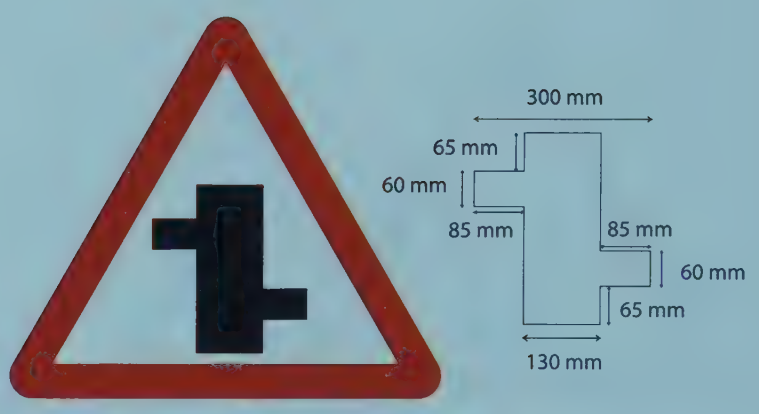


Fig. 15.20 Staggered Intersection

Fig. 15.21 Staggered Intersection

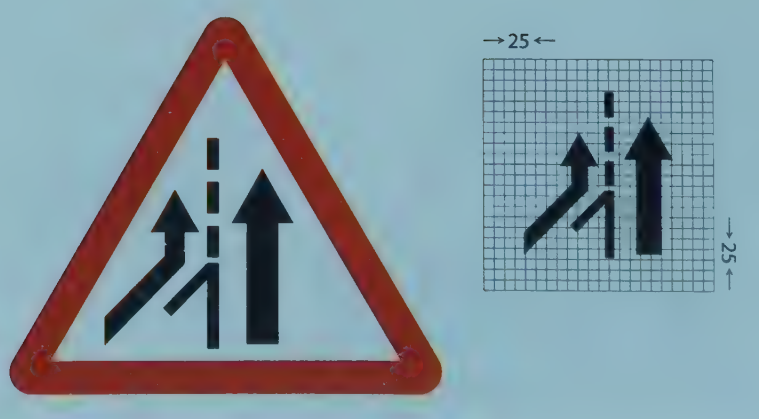


Fig. 15.22 Merging Traffic Ahead (From Left)

PLATE - II (Continued)

Fig. 15.22a Merging Traffic Ahead (From Right)

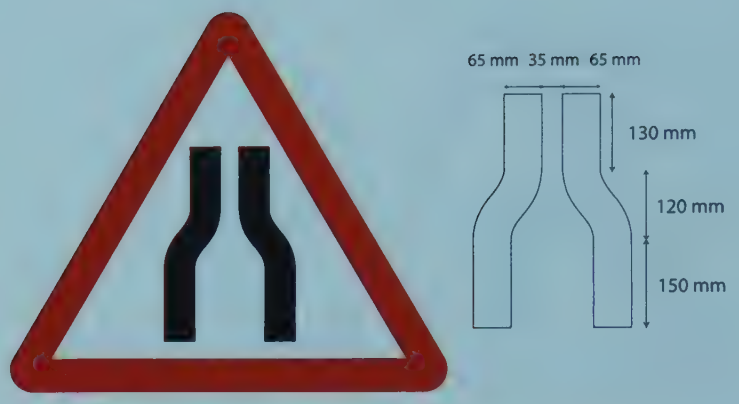


Fig. 15.23 Narrow Road Ahead

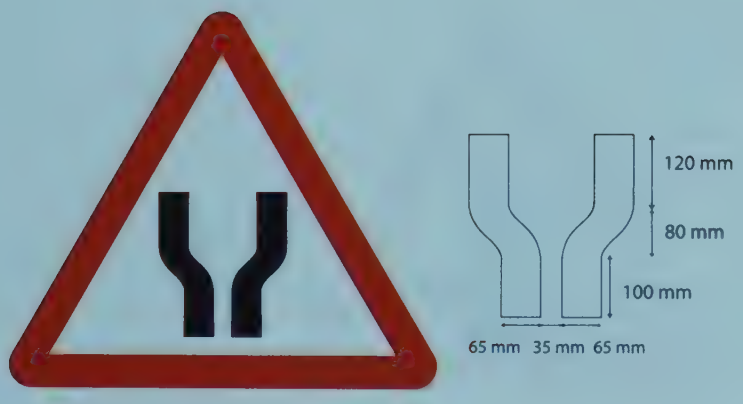


Fig. 15.24 Road Widens

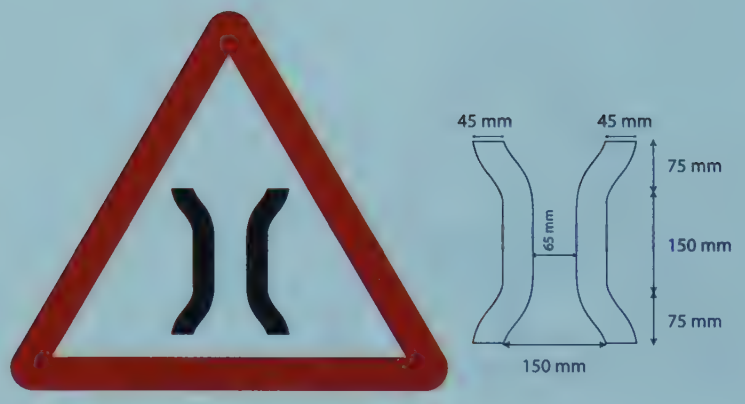


Fig. 15.25 Narrow Bridge Ahead

Fig. 15.26 Steep Ascent

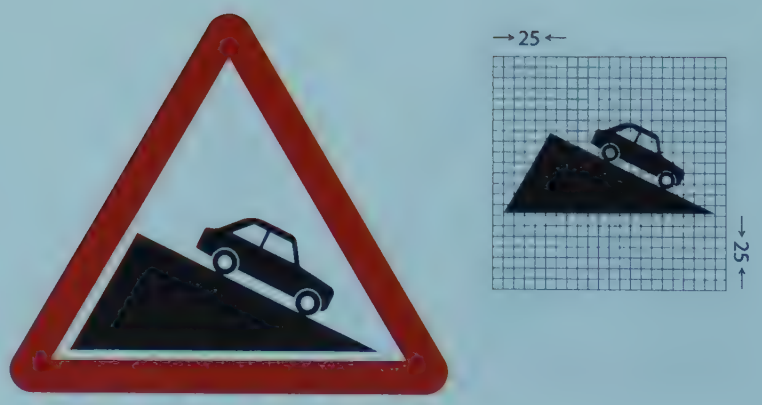


Fig. 15.27 Steep Descent

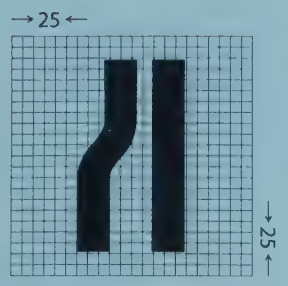


Fig. 15.28 Reduced Carriageway
Left Lane(s) Reduced

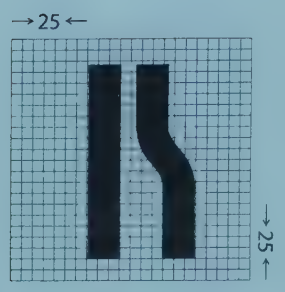


Fig. 15.29 Reduced Carriageway
Right Lane(s) Reduced

Fig. 15.30 Start of Dual Carriageway

Fig. 15.31 End of Dual Carriageway

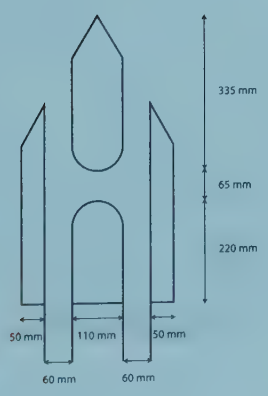


Fig. 15.32 Gap in Median

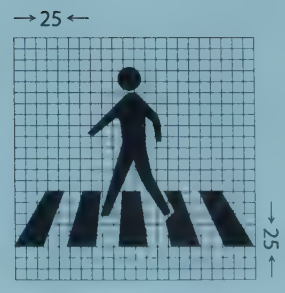


Fig. 15.33 Pedestrian Crossing

PLATE - II (Continued)

Fig. 15.34 School Ahead

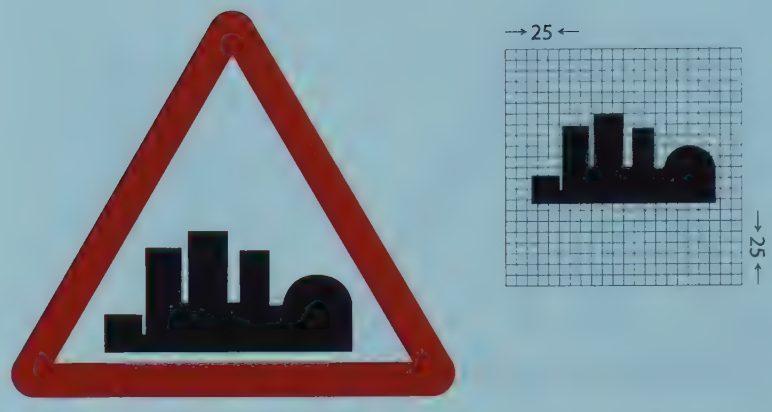


Fig. 15.35 Built-up Area

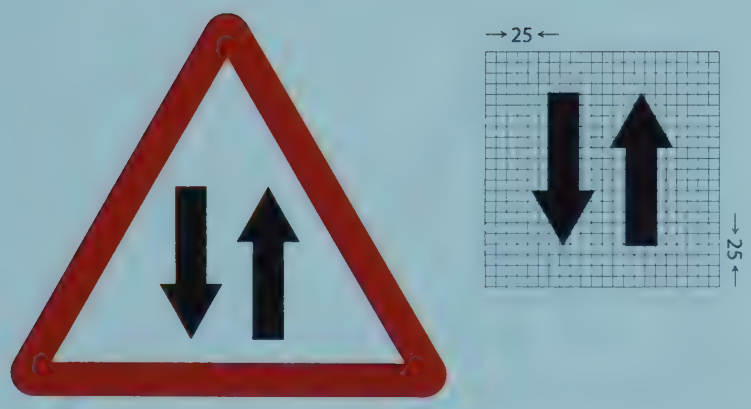


Fig. 15.36 Two Way Operation

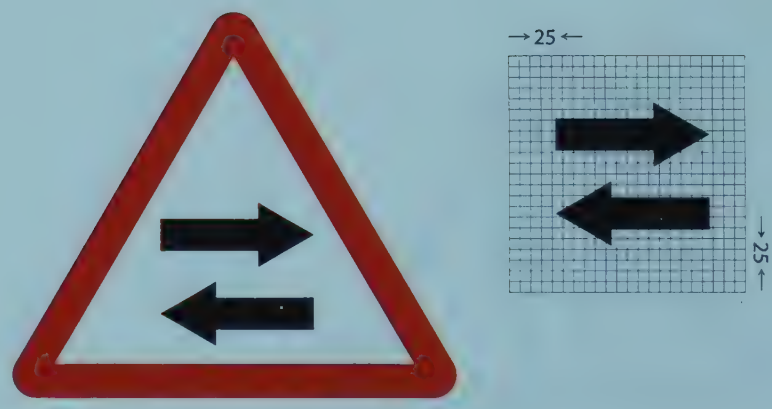


Fig. 15.37 Two way Traffic on Cross Road Ahead Warning

Fig. 15.38 Lane Closed (Two Lane Carriageway)

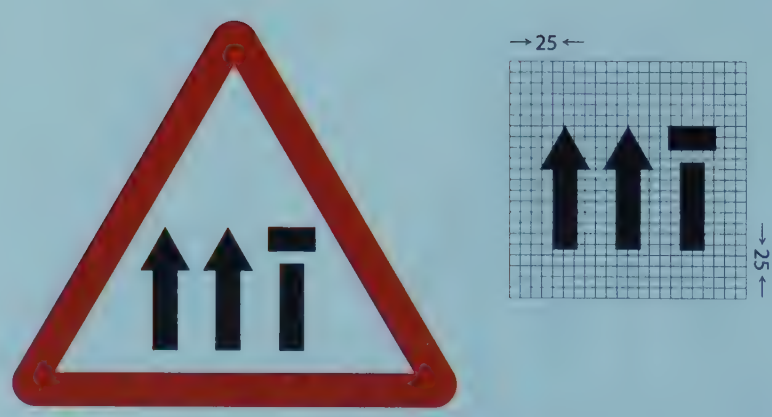


Fig. 15.39 Lane Closed (Three Lane Carriageway)

PLATE - II (Continued)

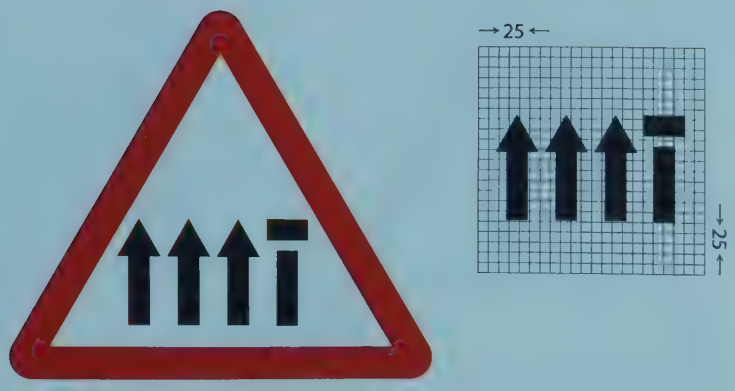


Fig. 15.40 Lane Closed (Four Lane Carriageway)

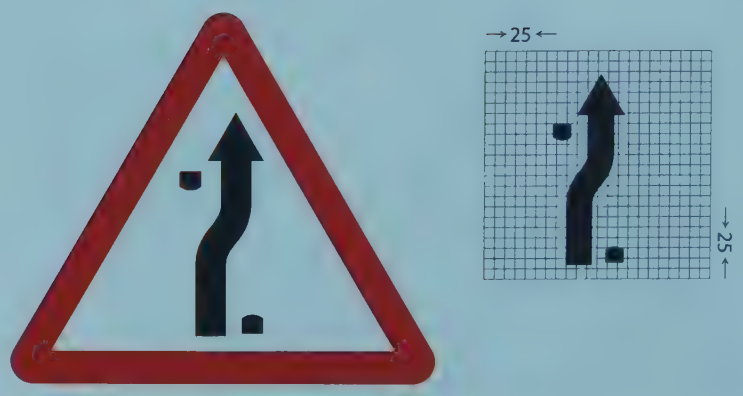


Fig. 15.41 Traffic Diversion on Dual Carriageway

Fig. 15.42 People at Work

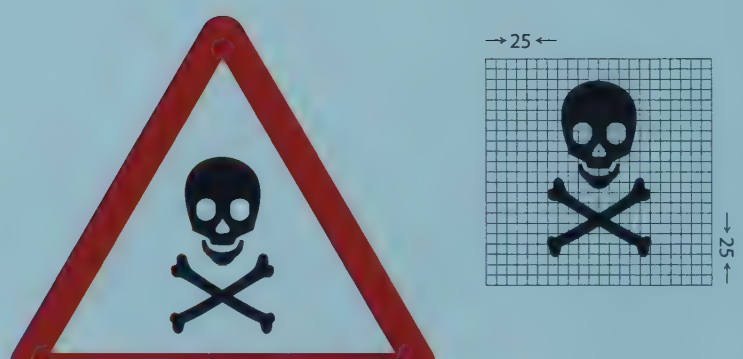


Fig.15.43 Danger Warning

Differently Abled Persons Ahead

Fig.15.44 Differently abled Persons Ahead

Deaf Persons Ahead

Fig.15.45a Deaf Persons Ahead

Blind Persons Ahead

Fig.15.45b Blind Persons Ahead

PLATE - II (Continued)

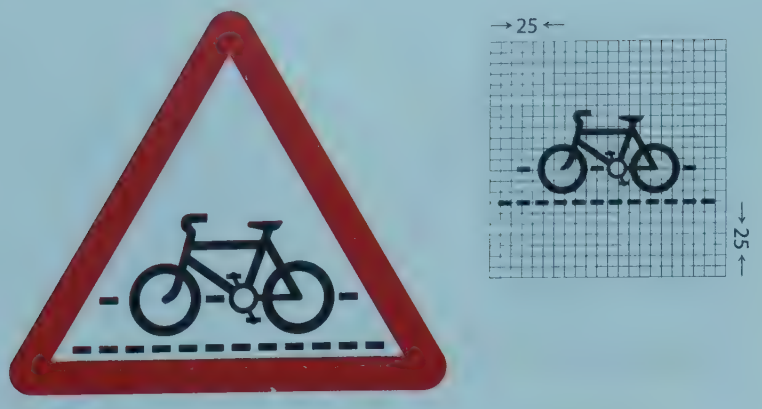


Fig. 15.46 Cycle Crossing

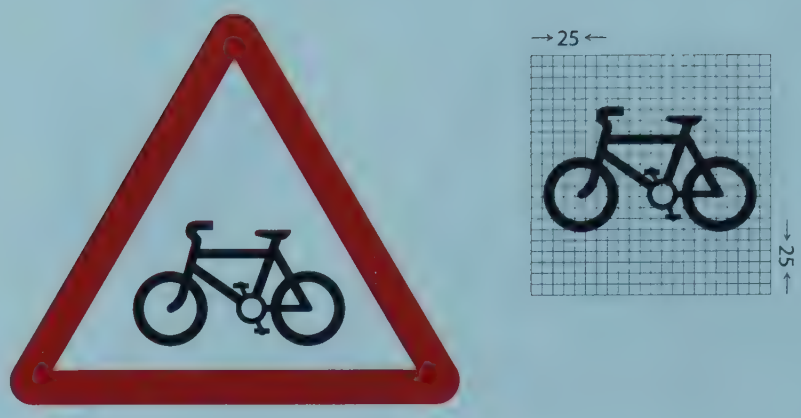


Fig. 15.47 Cycle Route Ahead

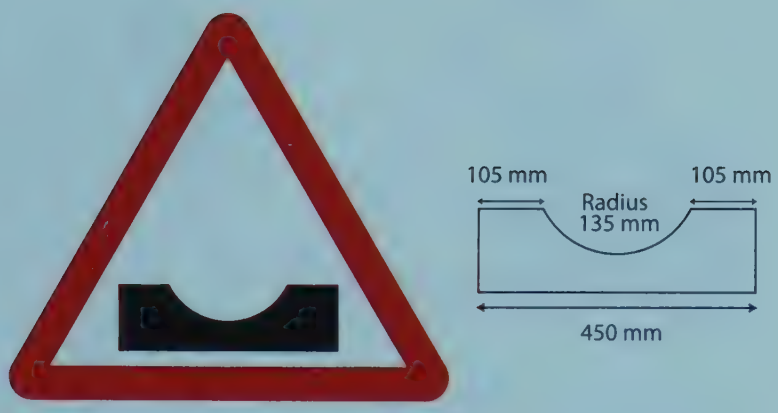


Fig. 15.48 Dangerous Dip

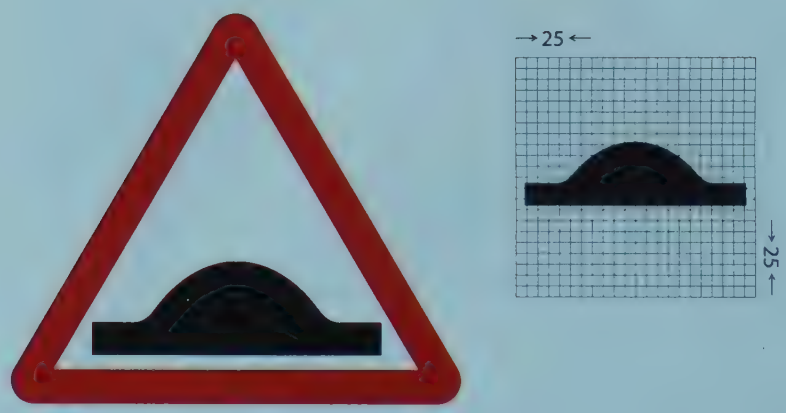


Fig. 15.49 Speed Breaker

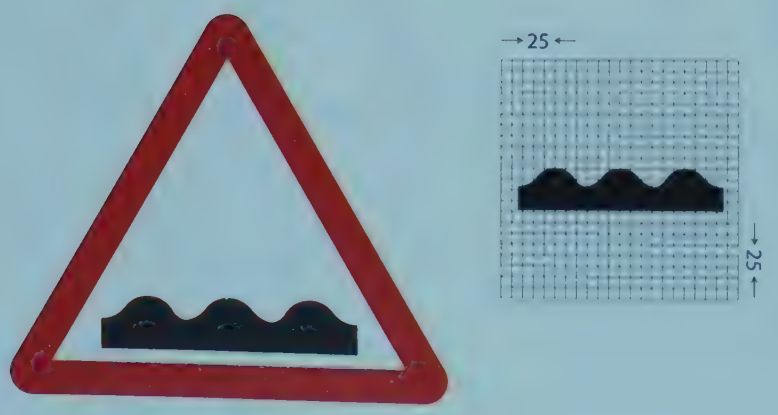


Fig. 15.50 Rumble Strip

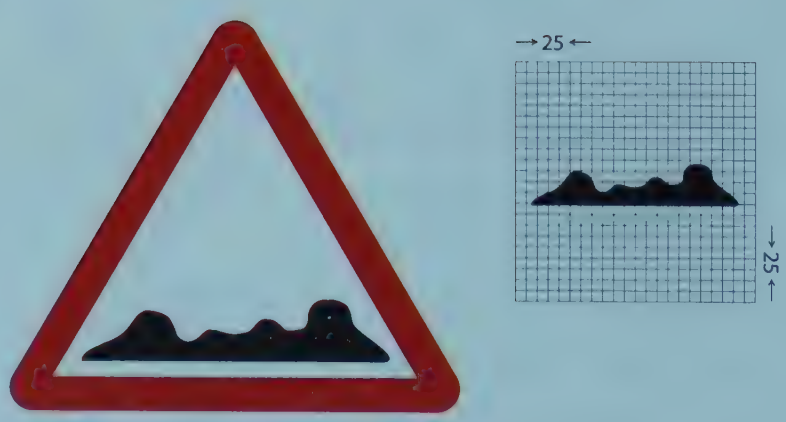


Fig. 15.51 Rough Road

PLATE - II (Continued)

Fig. 15.52 Soft Verges

Fig. 15.53 Loose Gravel

Fig. 15.54 Slippery Road

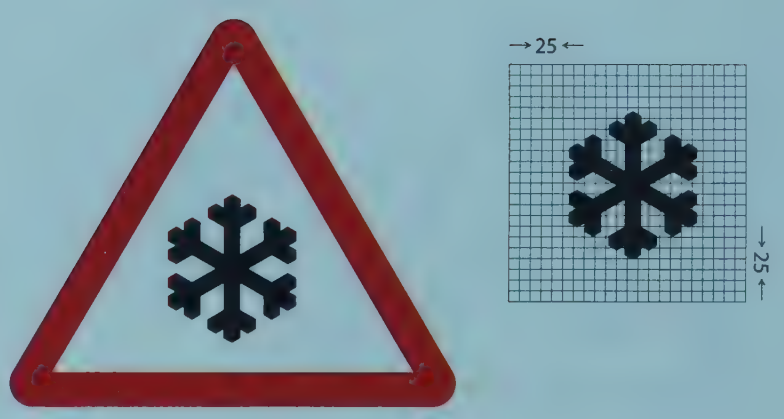


Fig. 15.55 Slippery Road because of Ice

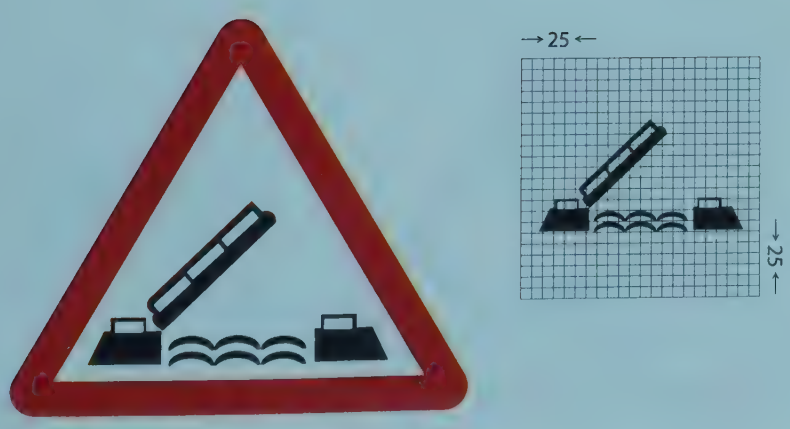


Fig. 15.56 Opening or Swing Bridge

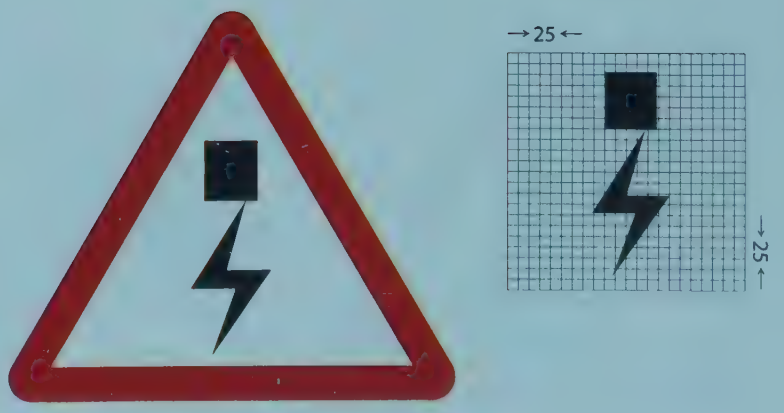


Fig. 15.57 Overhead Cables

PLATE - II (Continued)

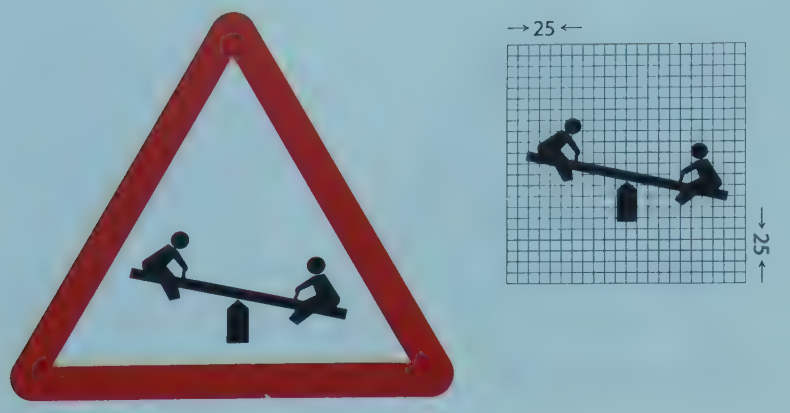


Fig. 15.58 Playground Ahead

Fig. 15.59 Quay Side or River Bank

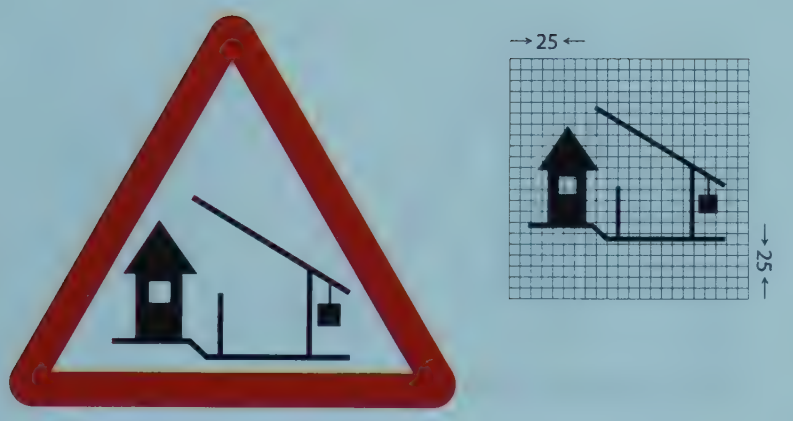


Fig. 15.60 Barrier

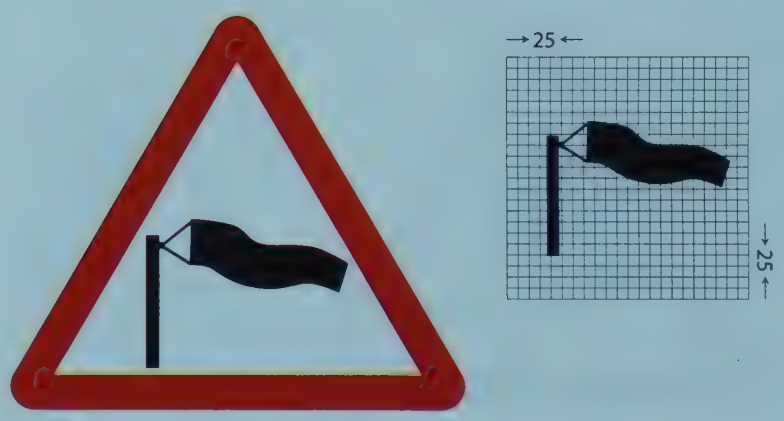


Fig. 15.61 Sudden Side Winds

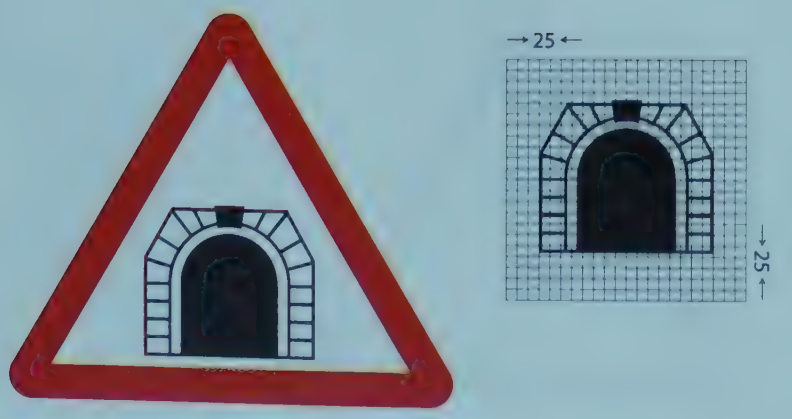


Fig. 15.62 Tunnel Ahead

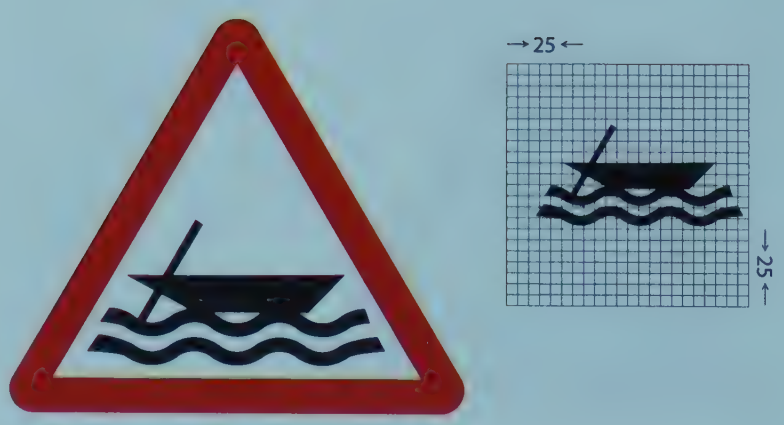


Fig. 15.63 Ferry

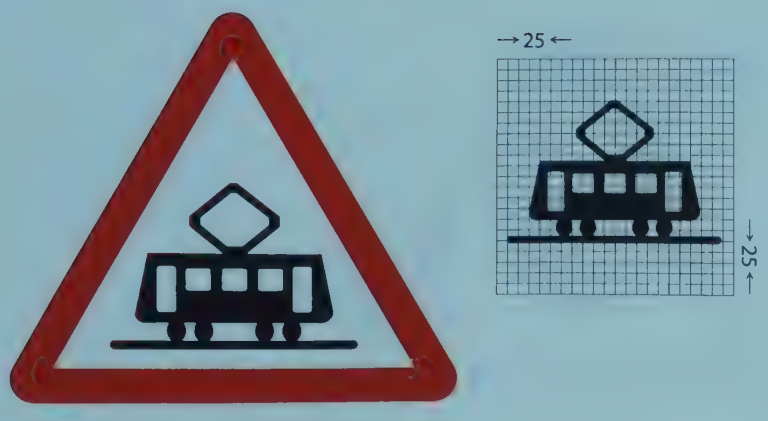


Fig. 15.64 Trams Crossing

Fig. 15.65 Falling Rocks

Fig. 15.66 Cattle Crossing

Fig. 15.67 Wild Animals

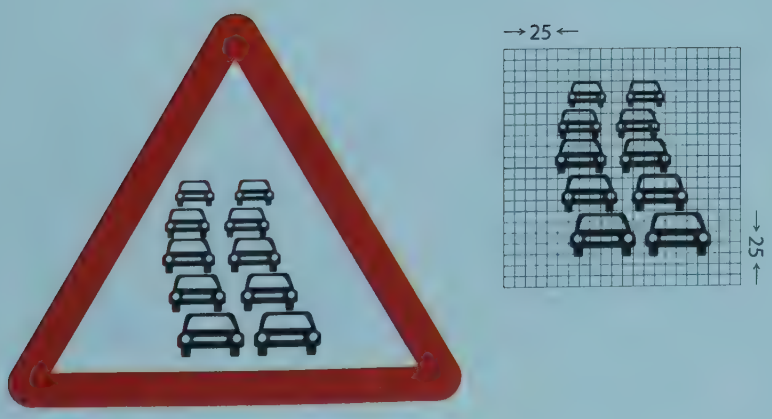


Fig. 15.68 Queues Likely Ahead

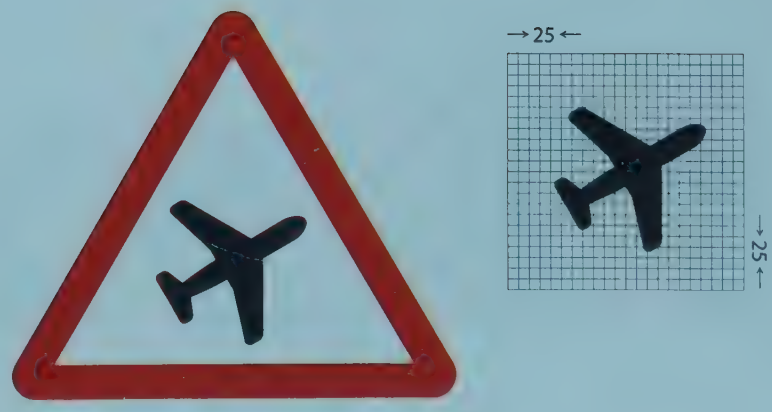
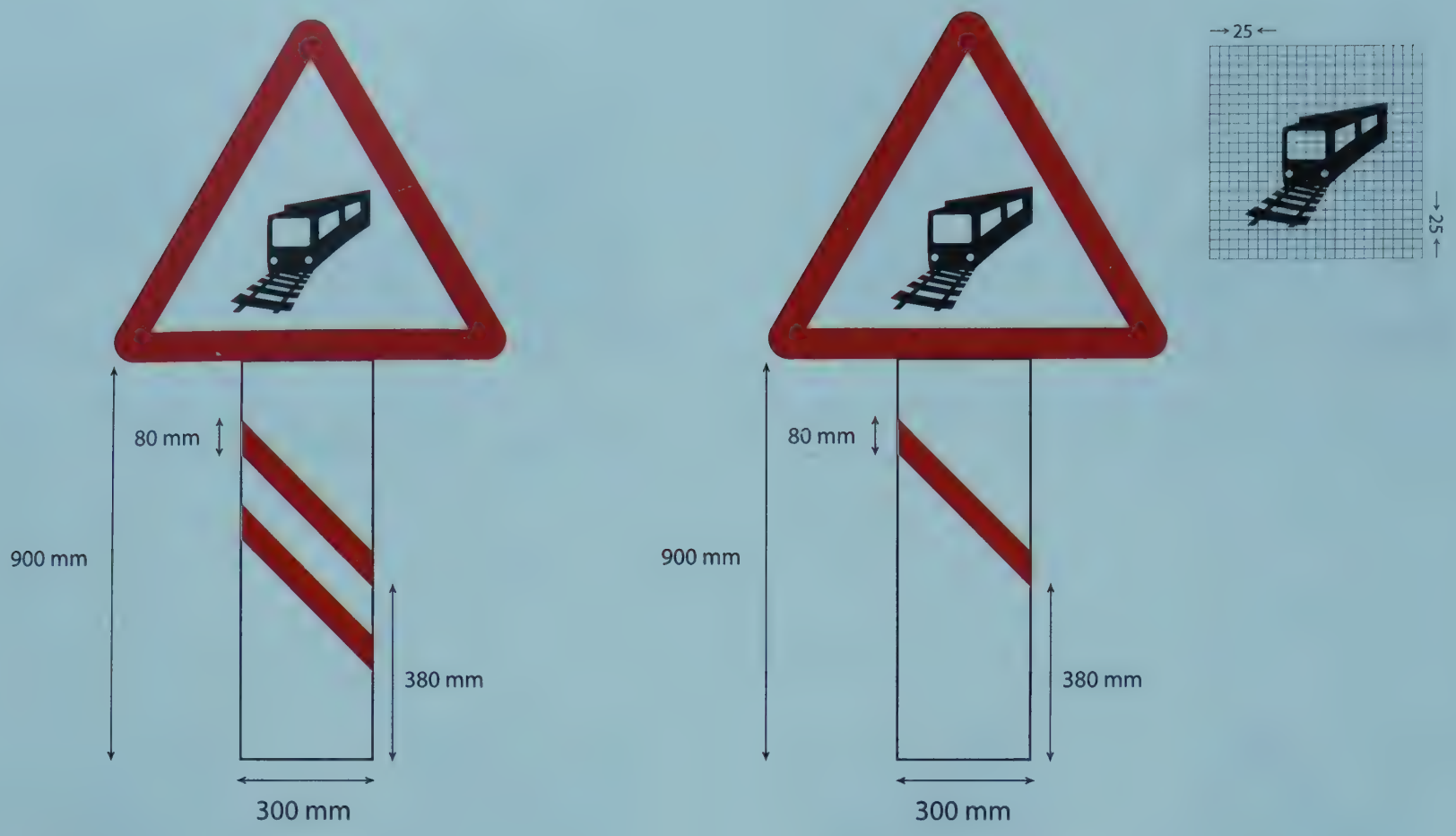


Fig. 15.69 Low Flying Aircraft

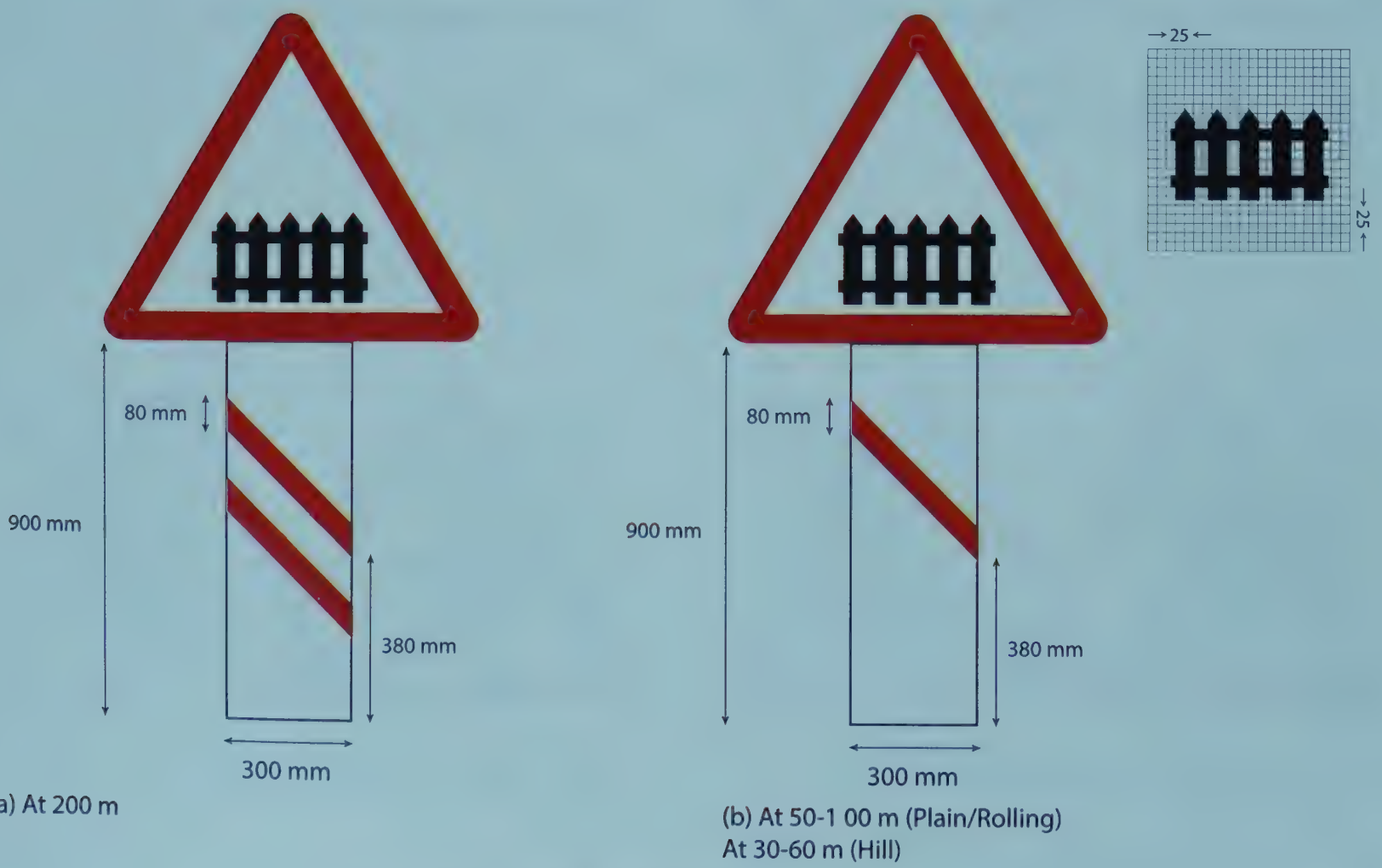
PLATE - II (Continued)



(a) At 200 m

(b) At 50-100 m (Plain/Rolling)
At 30-60 m (Hill)

Fig. 15.70 Unguarded Railway Crossing



(a) At 200 m

(b) At 50-1 00 m (Plain/Rolling)
At 30-60 m (Hill)

Fig. 15.71 Guarded Railway Crossing

Fig. 15.72 Crash Prone Area Ahead

Fig. 15.73 U Turn Ahead

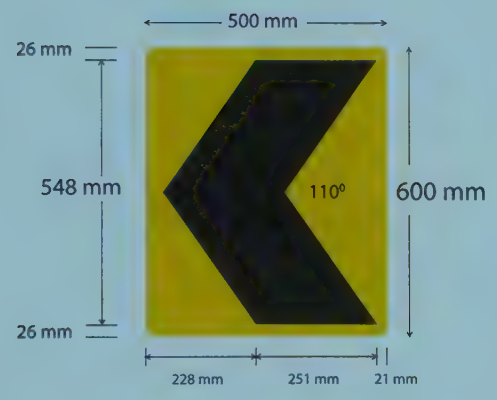


Fig. 15.74 Single Chevron (Normal)

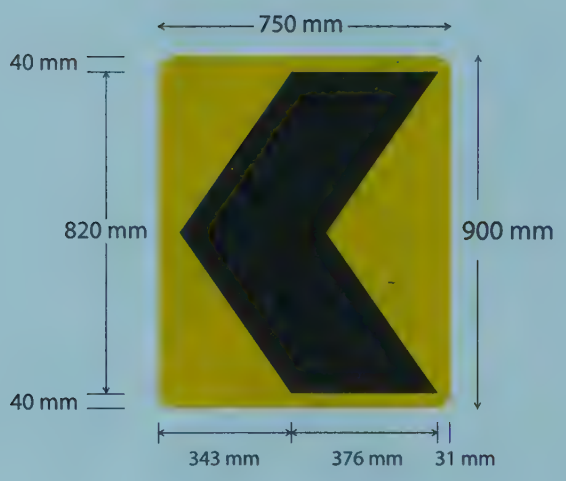


Fig. 15.75 Single Chevron(>100kmph speed)

Fig. 15.76 Double Chevron

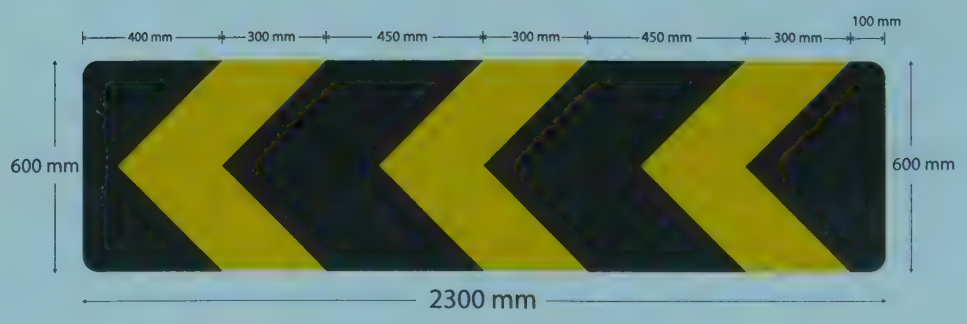


Fig. 15.77 Triple Chevron

PLATE - II (Continued)

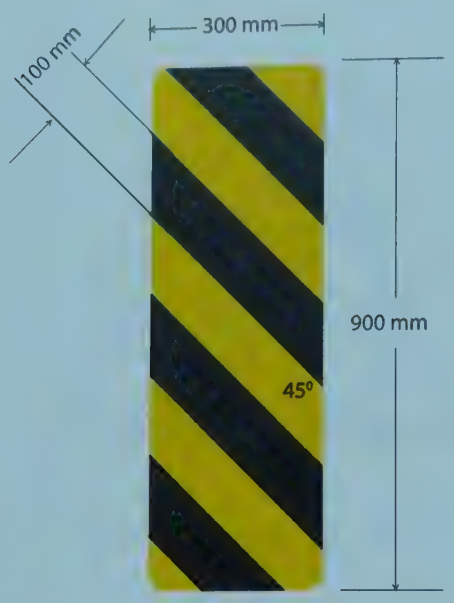


Fig. 15.78 Object Hazard (Left)

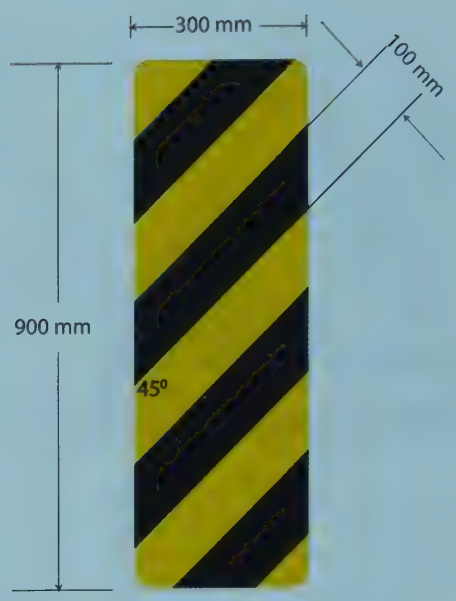


Fig. 15.79 Object Hazard (Right)

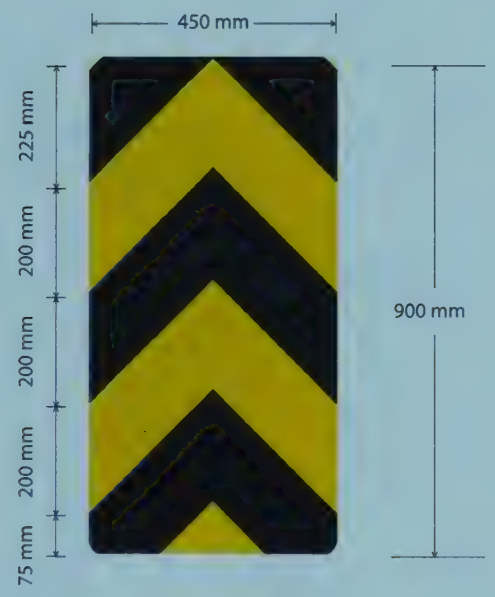
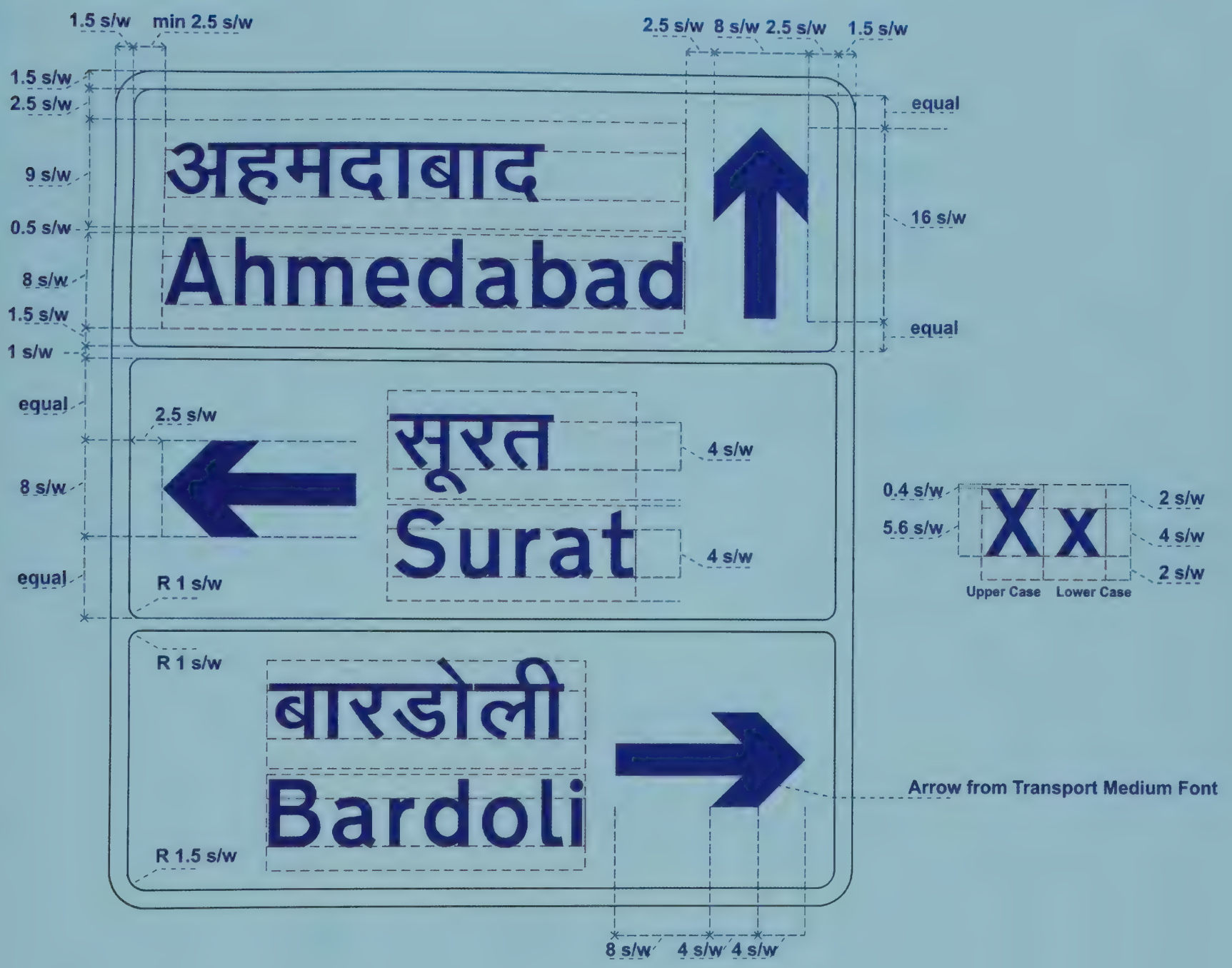


Fig. 15.80 Two Way Object Hazard Marker

INFORMATORY SIGNS



1 s/w = 1/4 of lower case "x" height

English Font- Transport Medium
Hindi Font - Narad Bold

Fig. 16.01 Stack Type Advance Direction Sign (Shoulder Mounted)

PLATE - III (Continued)

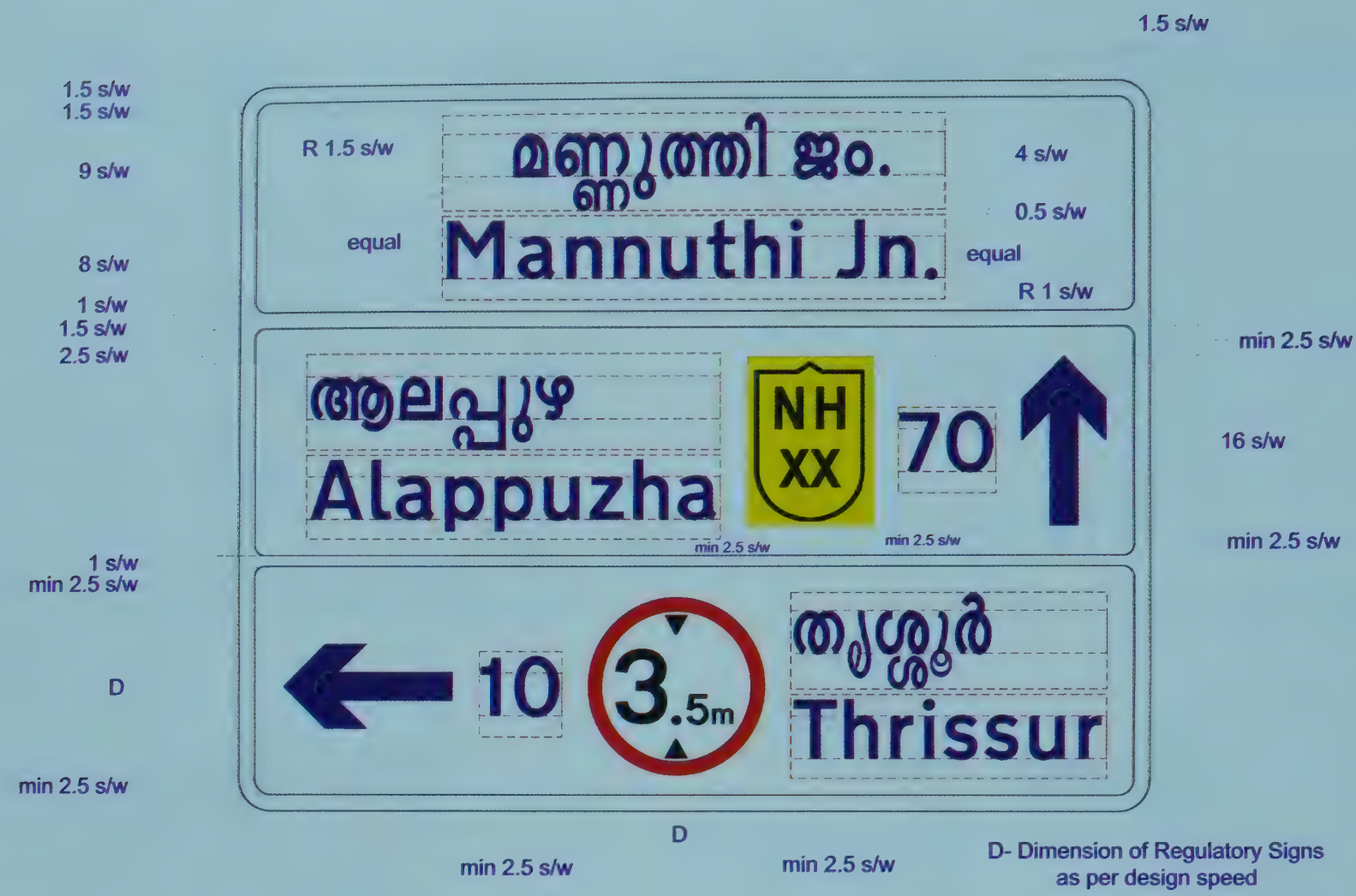
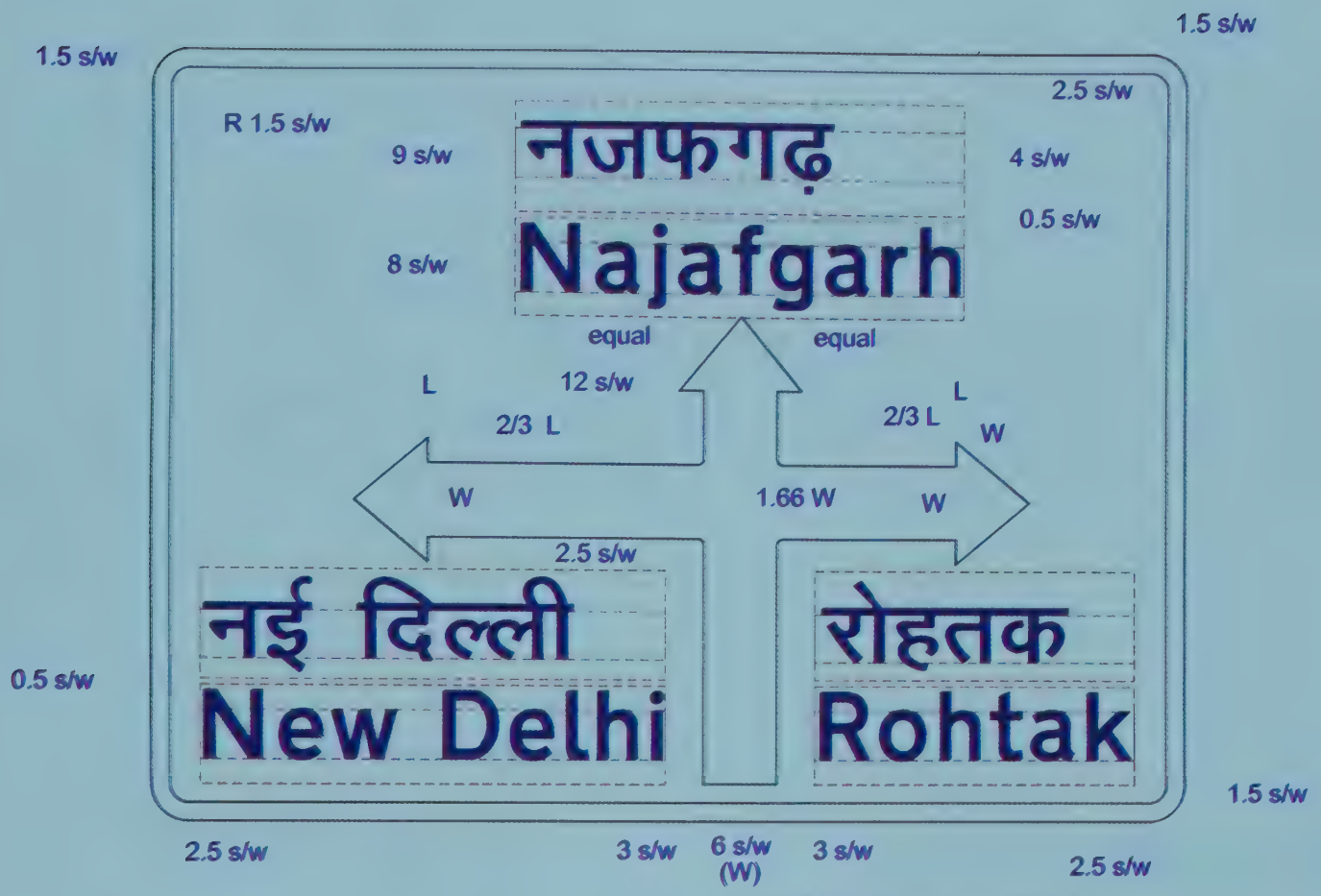


Fig. 16.01a Inclusion of Cautionary and Regulatory Signs in Advance Direction Signs

PLATE - III (Continued)



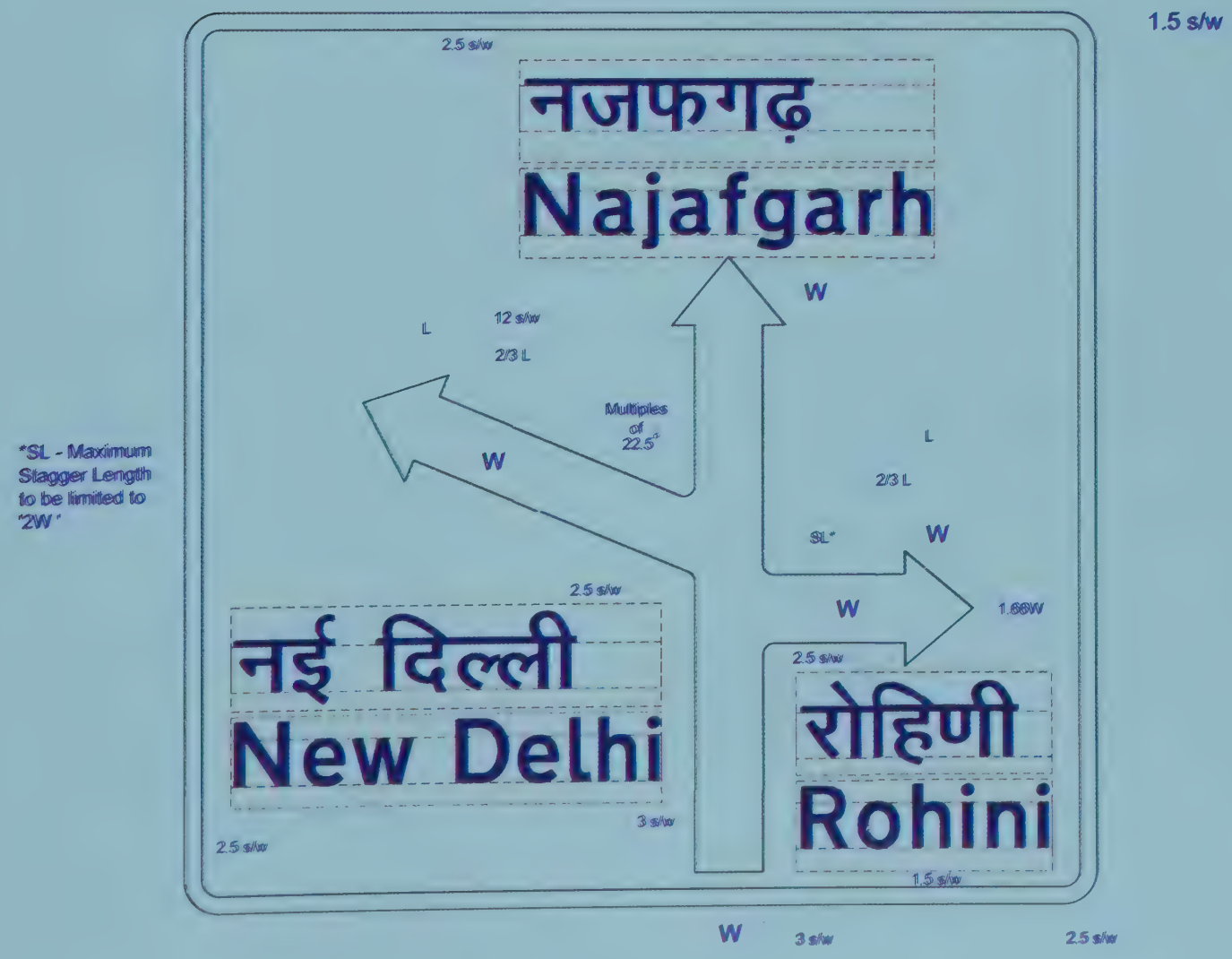
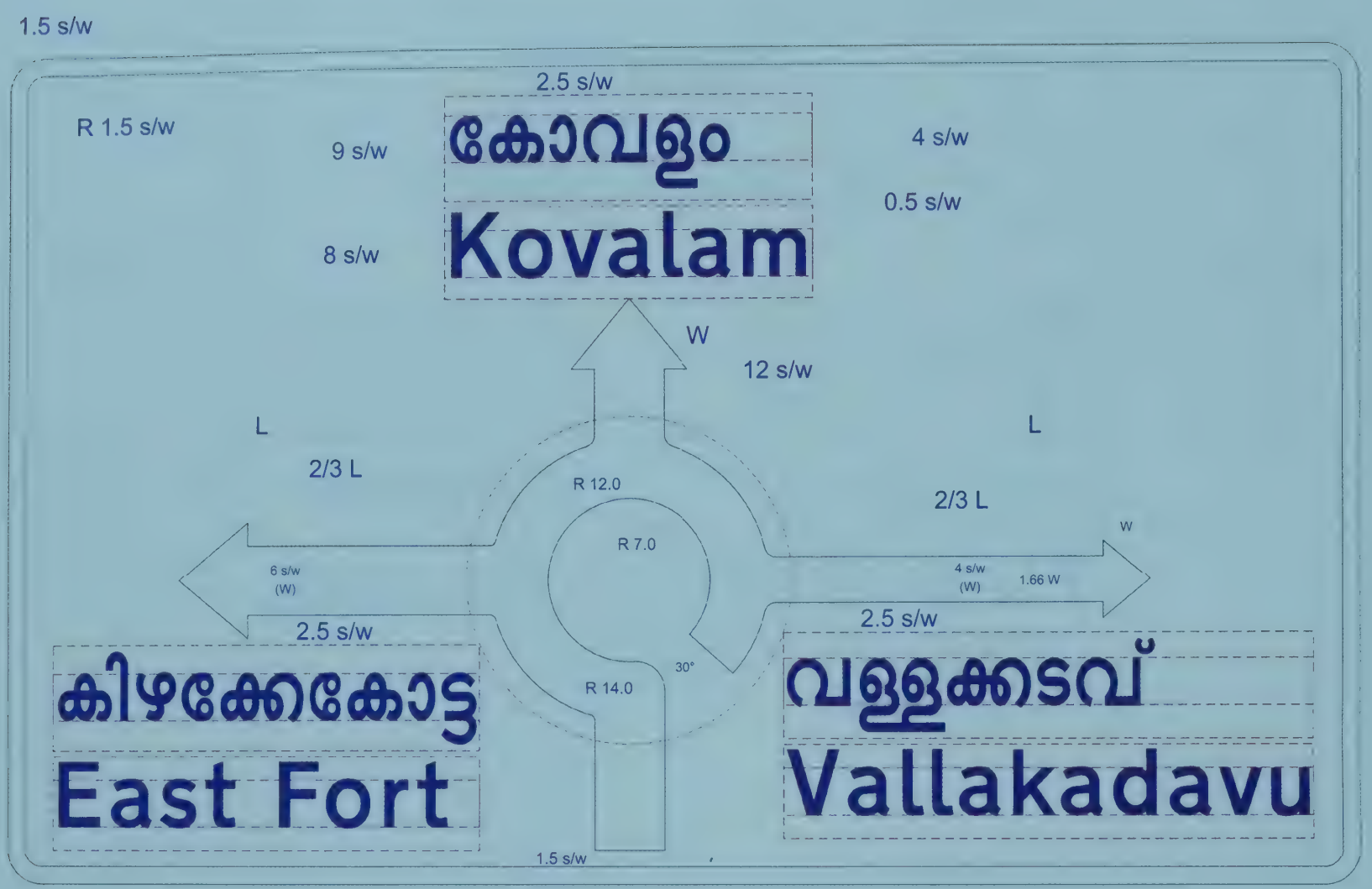


Fig. 16.02 Map Type Advance Direction Sign

PLATE - III (Continued)



2.5 s/w

6 s/w
(W)

2.5 s/w

Width of route Symbol (W)
6 s/w for NH/SH/Urban Roads
4 s/w for MDR
2.5 s/w for ODR and Village Roads

Fig. 16.03 Map Type Advance Direction Sign on Roundabout

PLATE - III (Continued)

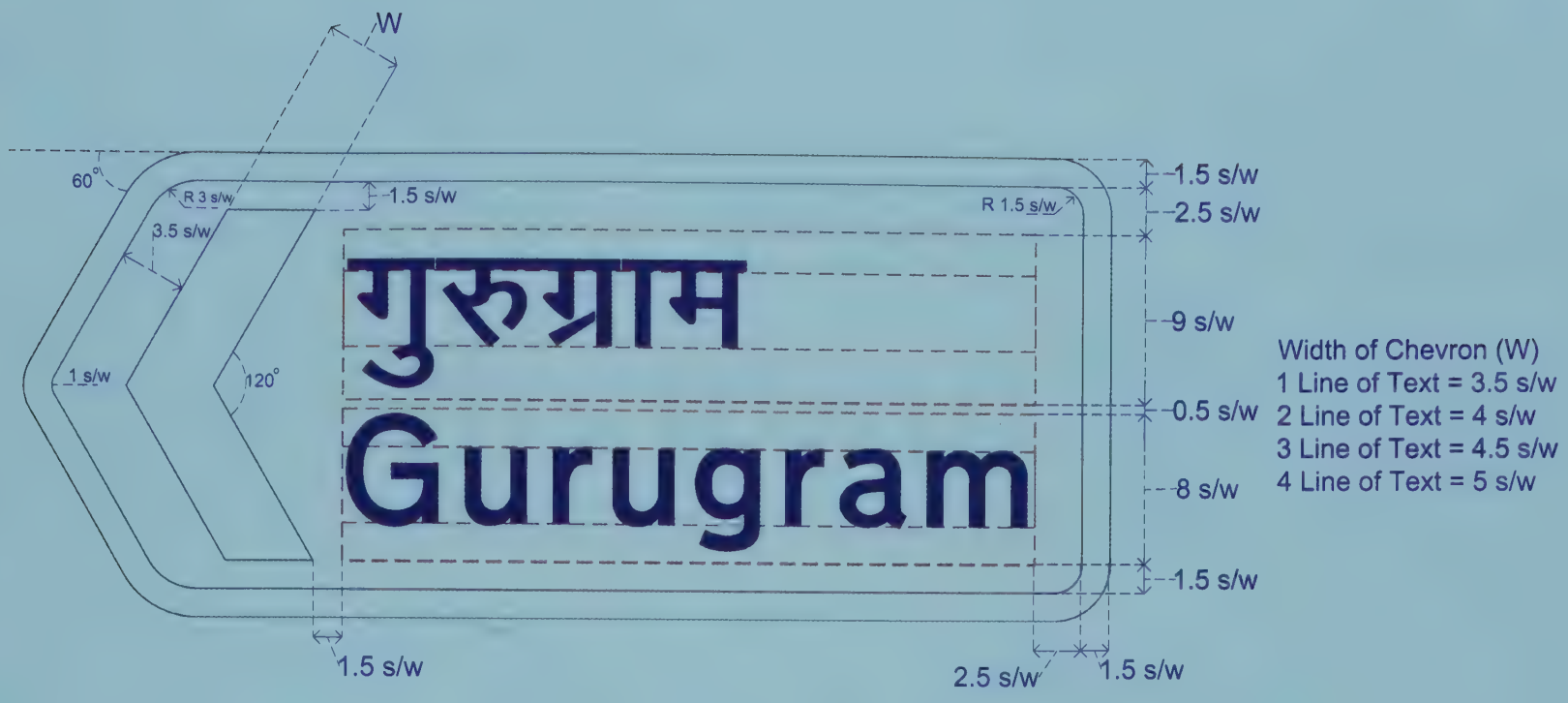


Fig. 16.04 Flag Type Direction Sign

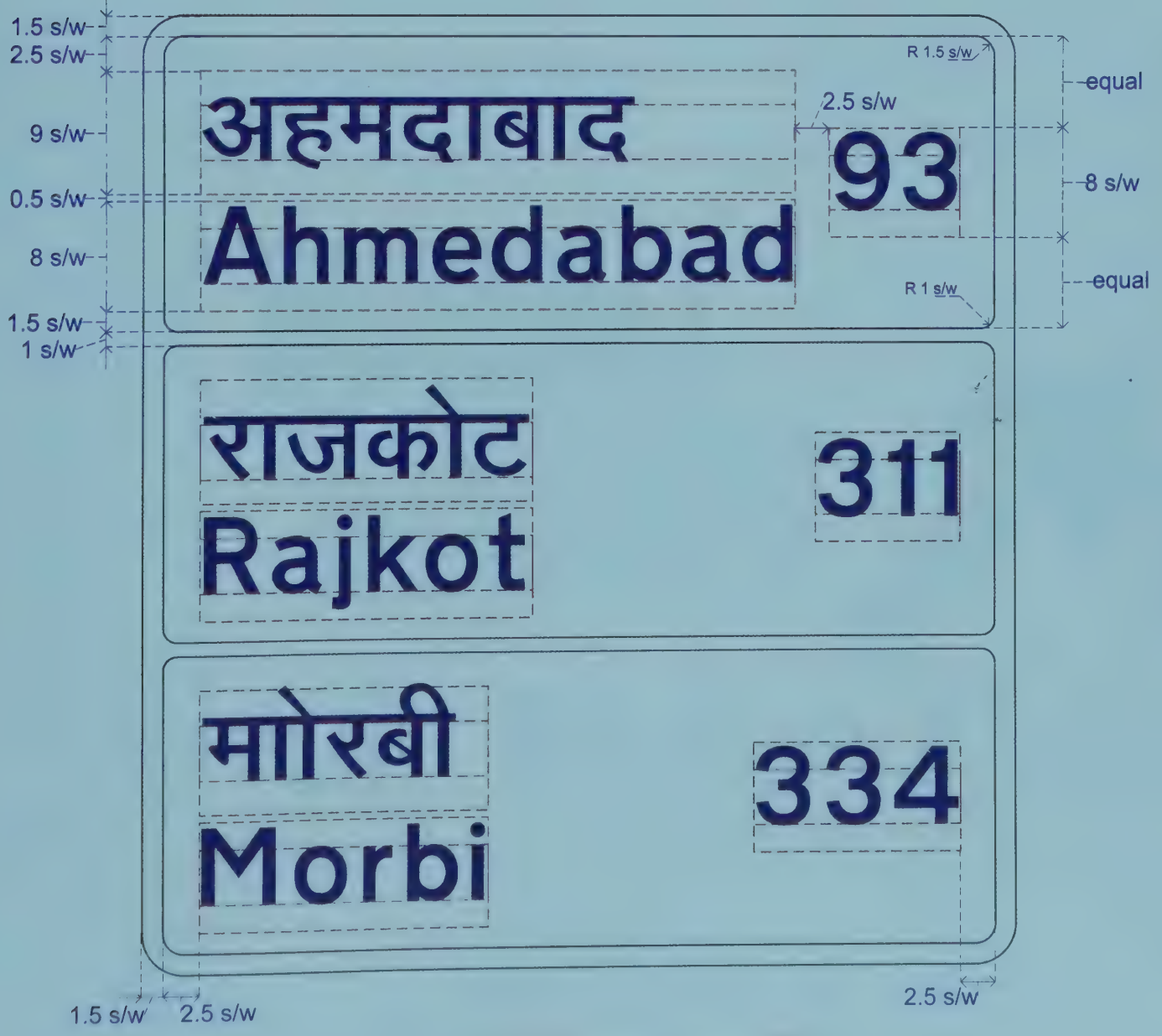


Fig. 16.05 Reassurance Sign

PLATE - III (Continued)

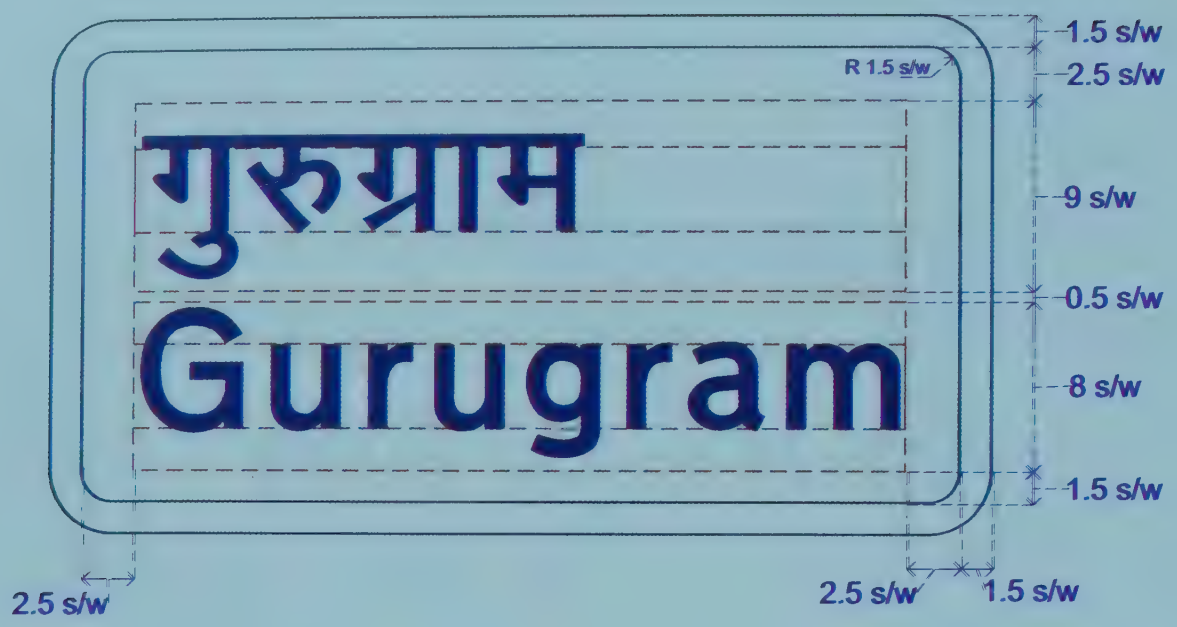


Fig. 16.06 Place Identification Sign

Fig. 16.07 Truck Lay-By Sign

PLATE - III (Continued)

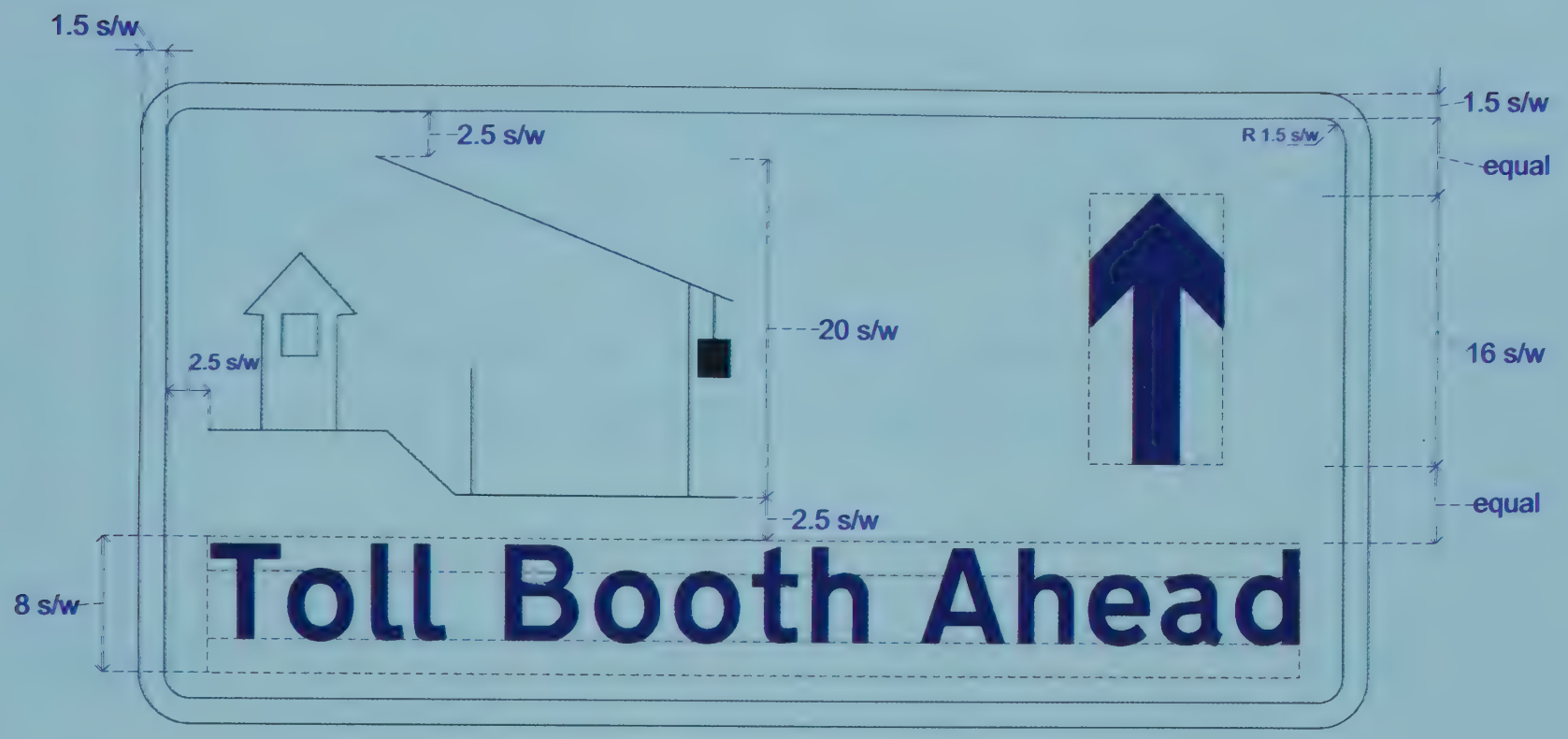


Fig. 16.08 Toll Booth Ahead Sign

Fig. 16.09 Weigh Bridge Ahead Sign

PLATE - III (Continued)

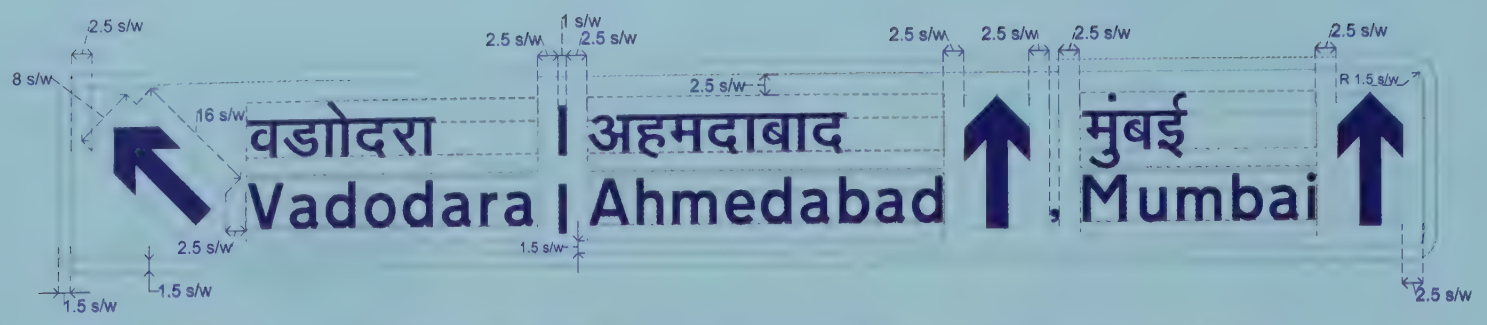


Fig. 16.10 Gantry Mounted Advance Direction Sign Ahead of a Grade Separated Junction

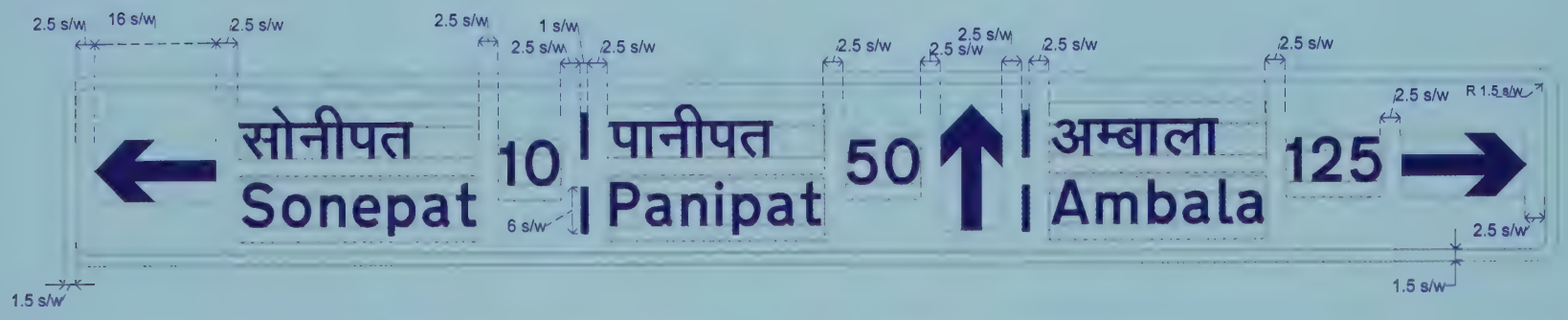


Fig. 16.11 Gantry Mounted Advance Direction Ahead of a At-Grade Junction

Fig. 16.12 Advance Direction Signs for an Interchange

PLATE - III (Continued)

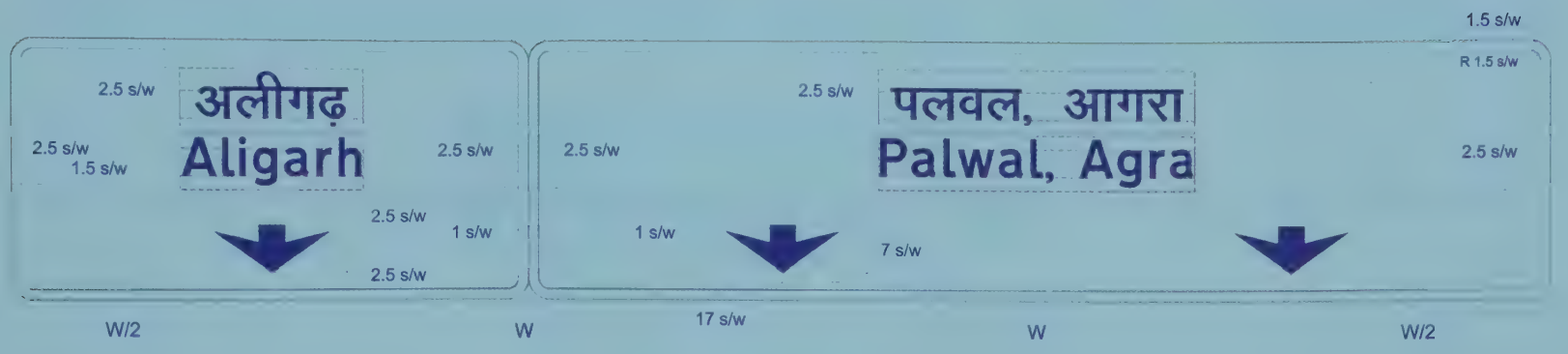


Fig. 16.13 Lane Dedicated Gantry Signs

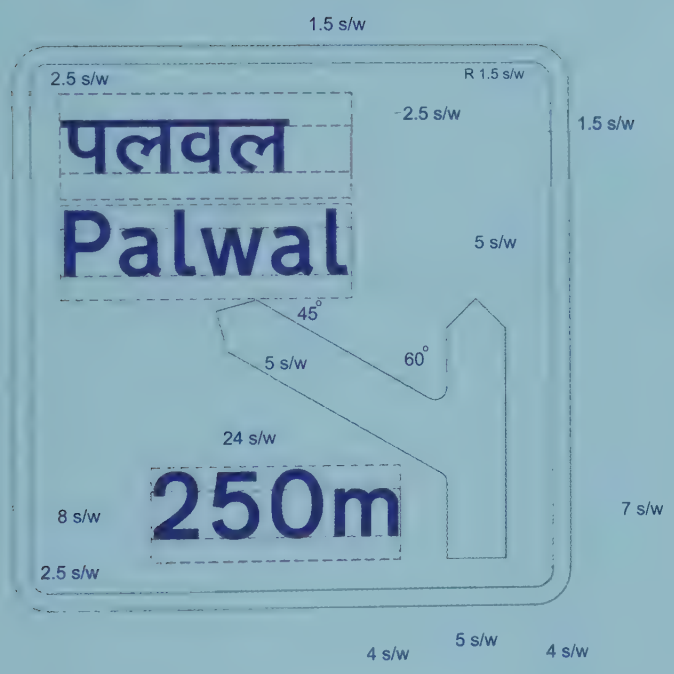


Fig. 16.14a Shoulder Mounted Sign in Advance of Grade Separated Junction

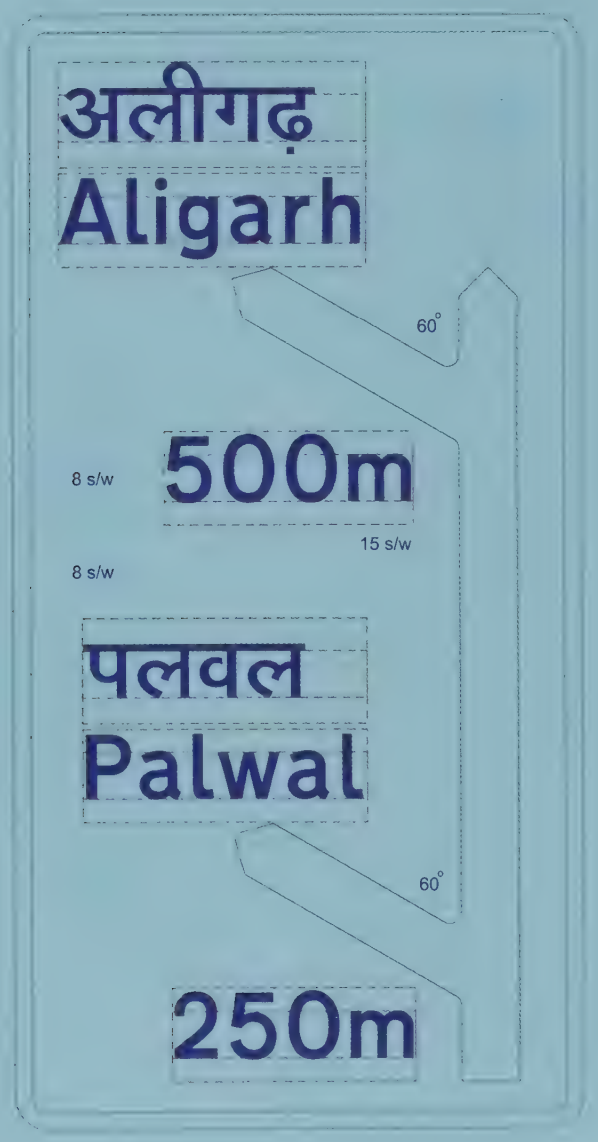


Fig. 16.14b Shoulder Mounted Sign in Advance of an Interchange

PLATE - III (Continued)

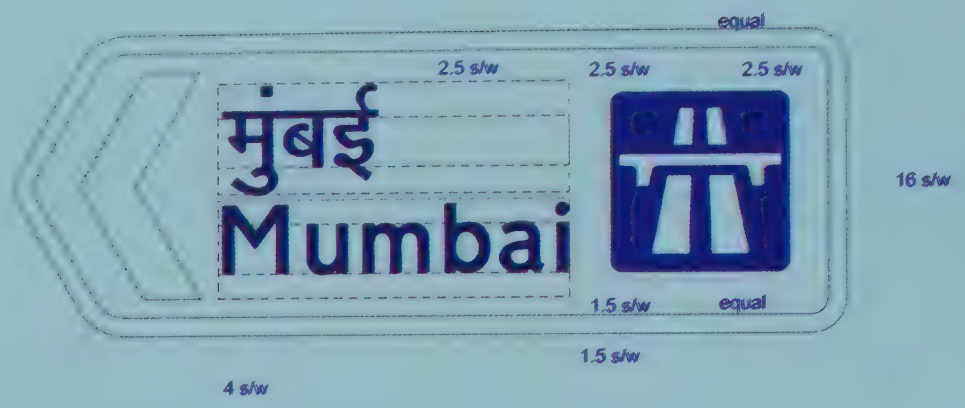
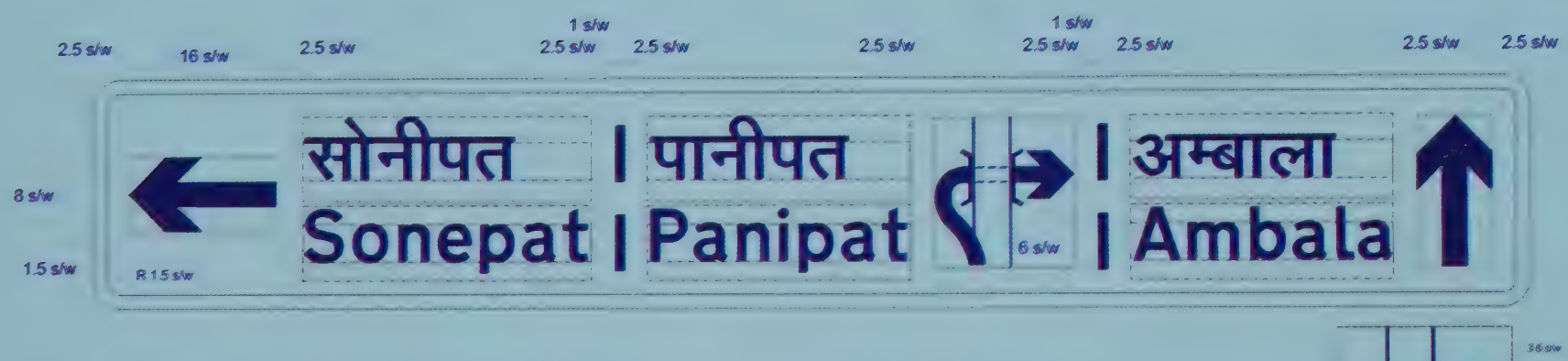


Fig. 16.15 Expressway Ahead Sign



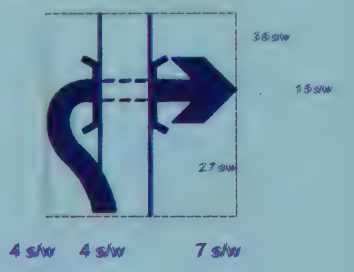


Fig. 16.16 Gantry Mounted Advance Direction Sign Ahead of a Flyover in Urban/City Roads

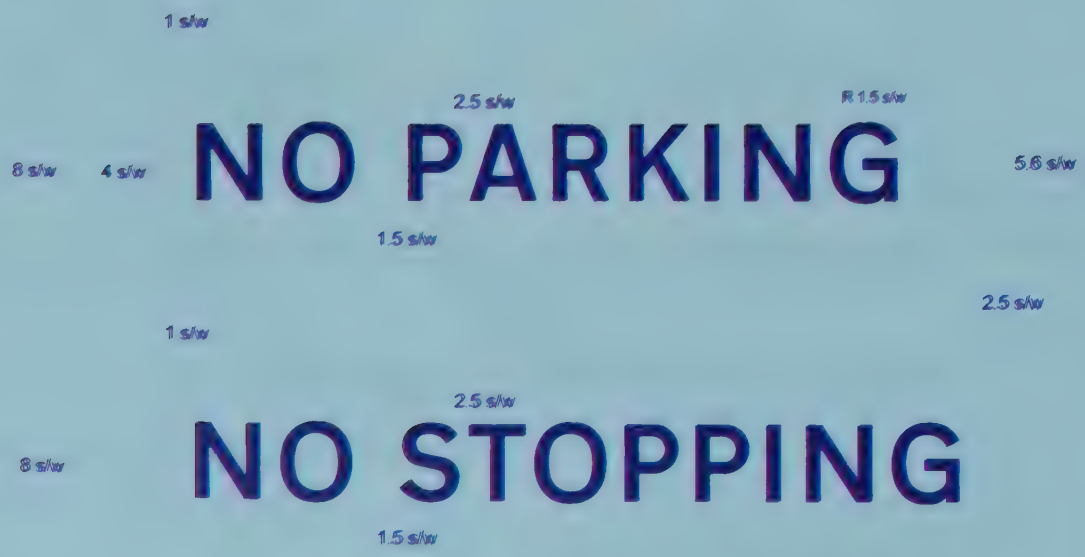


Fig. 16.17 Definition/Supplementary Plate

TOURISM RELATED SIGNS

Fig. 16.18 Tourist Destination Direction Information Signs Without Photograph

Fig. 16.19 Tourist Destination Direction Information Signs With Photograph

PLATE - IV (Continued)

Fig. 16.20 Finger Destination Direction Information Sign for Pedestrians

PLATE - IV (Continued)

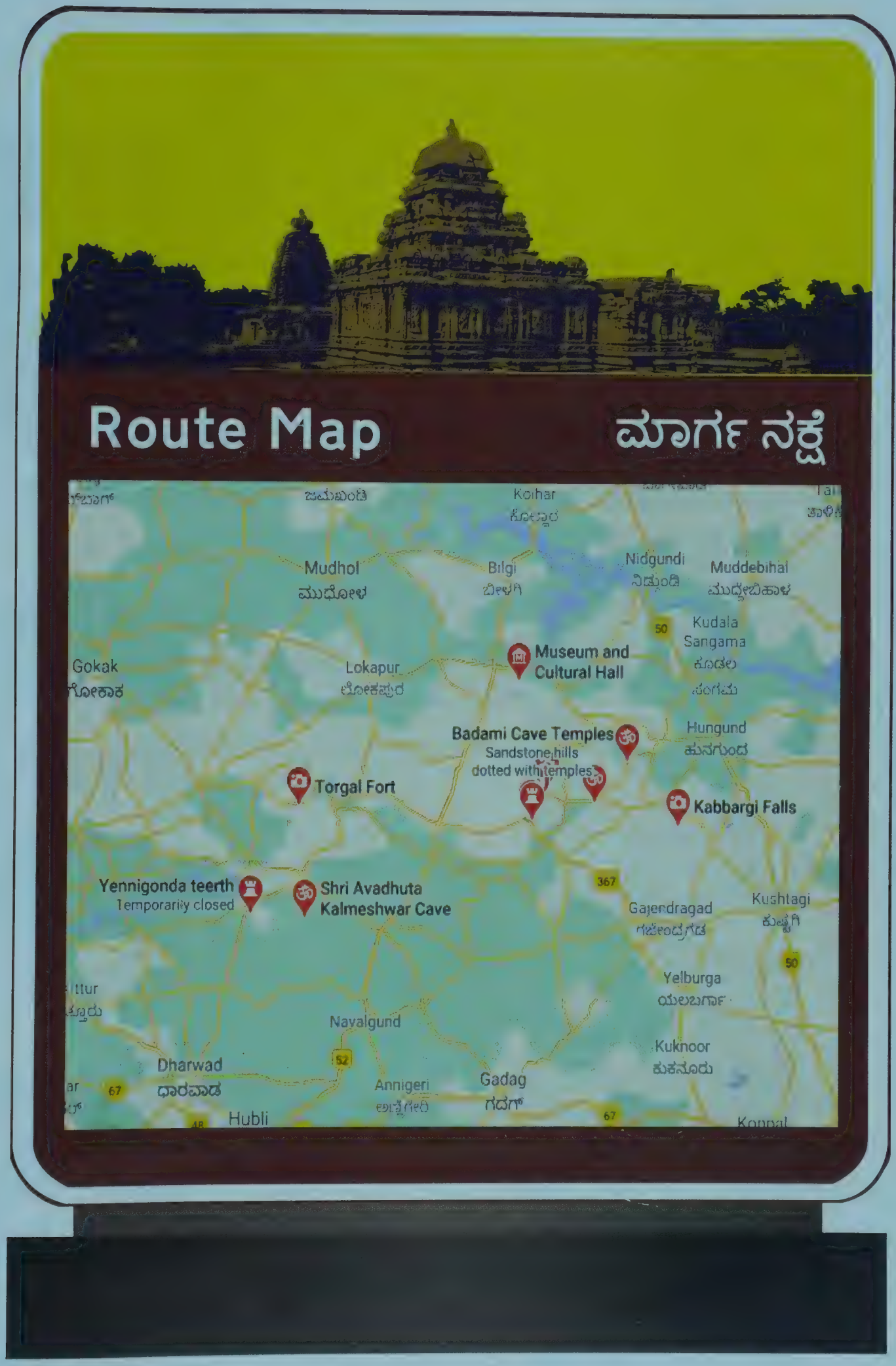


Fig. 16.21 Tourist Map Information Sign

PLATE - IV (Continued)

Fig. 16.22 Boundary Sign at Entrance to a City/Place

Fig. 16.23 Boundary Sign at Entrance to a Tourist Destination

FACILITY INFORMATION SIGNS

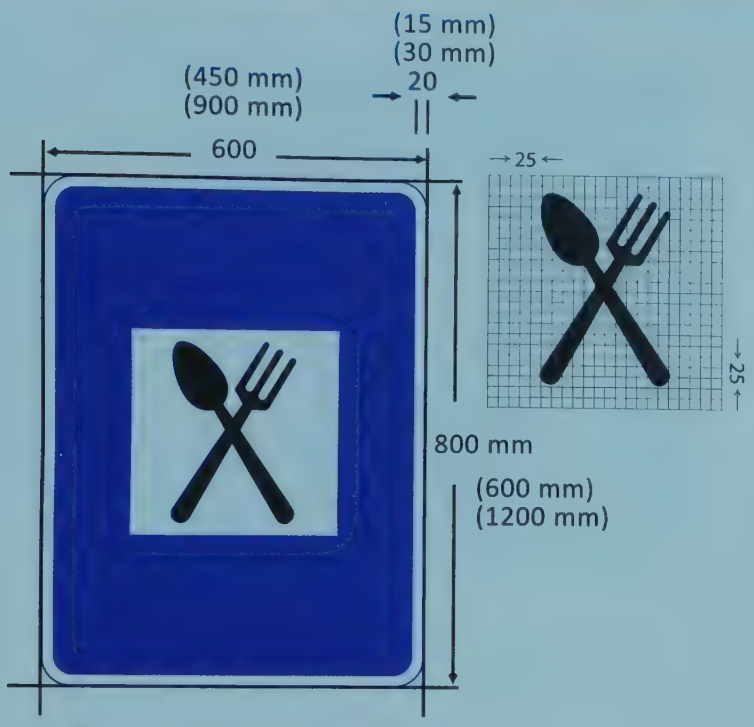


Fig. 17.01 Eating Place

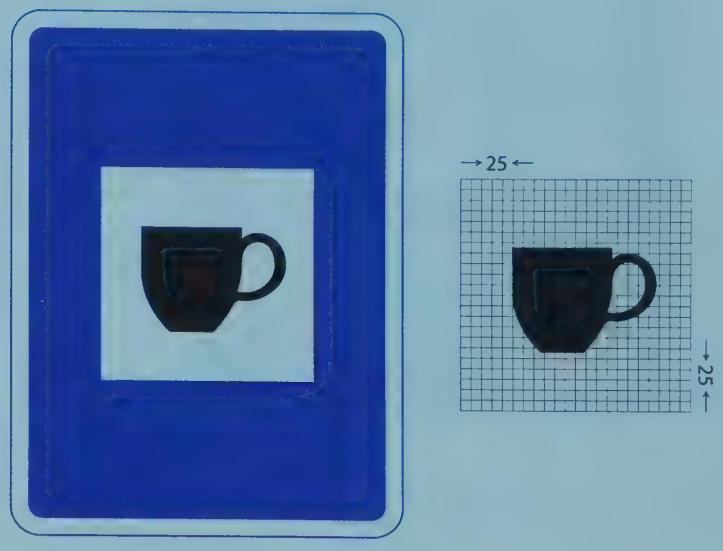


Fig. 17.02 Light Refreshment

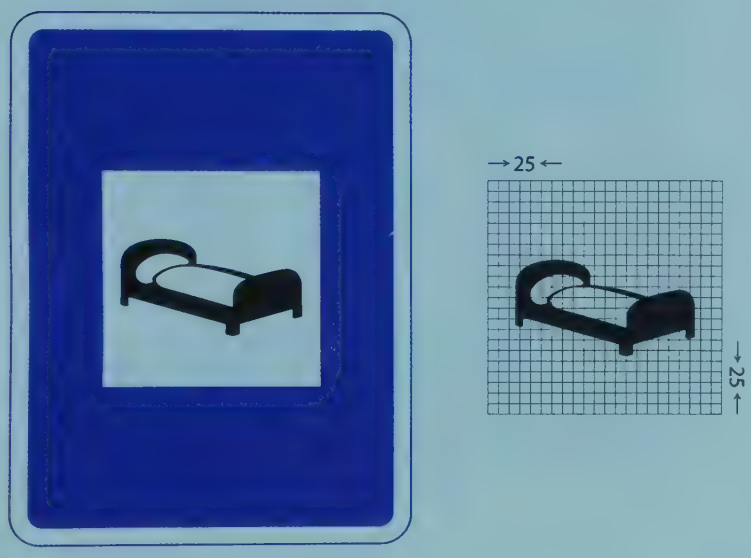


Fig. 17.03 Resting Place

Fig. 17.04 First Aid Post

Fig. 17.05 Toilet

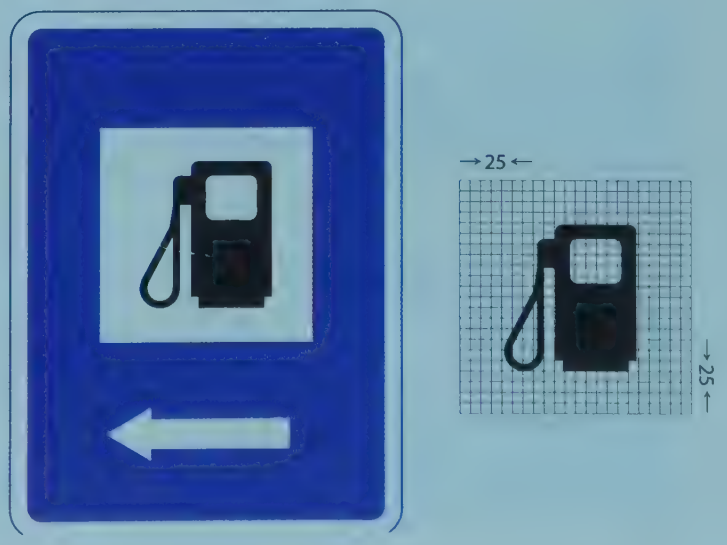


Fig. 17.06 Filling Station(Fuel Pump)

PLATE - V (Continued)

Fig. 17.07 Hospital

Fig. 17.08 Emergency SOS Facility

Fig. 17.09 U-Turn Ahead

Fig. 17.10 Pedestrian Subway

Fig. 17.11 Foot Over Bridge

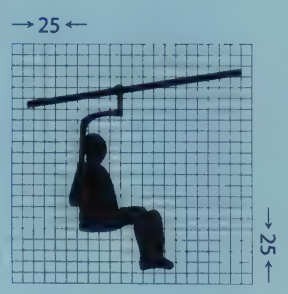


Fig. 17.12 Chair Lift

Fig. 17.13 Police Station

Fig. 17.14 Repair Facility

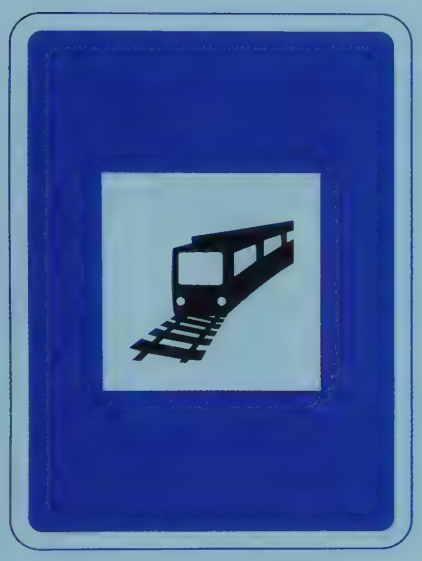


Fig. 17.15 Railway Station/ Metro Station/Monorail Station

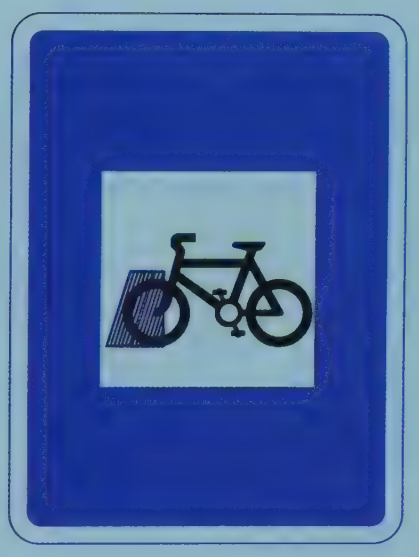


Fig. 17.16 Public Bike Sharing Stand

Fig. 17.17 Cycle Rickshaw Stand

Fig. 17.18 Taxi Stand

PLATE - V (Continued)

Fig. 17.19 Auto-rickshaw Stand

Fig. 17.20 Shared Taxi/Share Auto Stand

Fig. 17.21 Home Zone

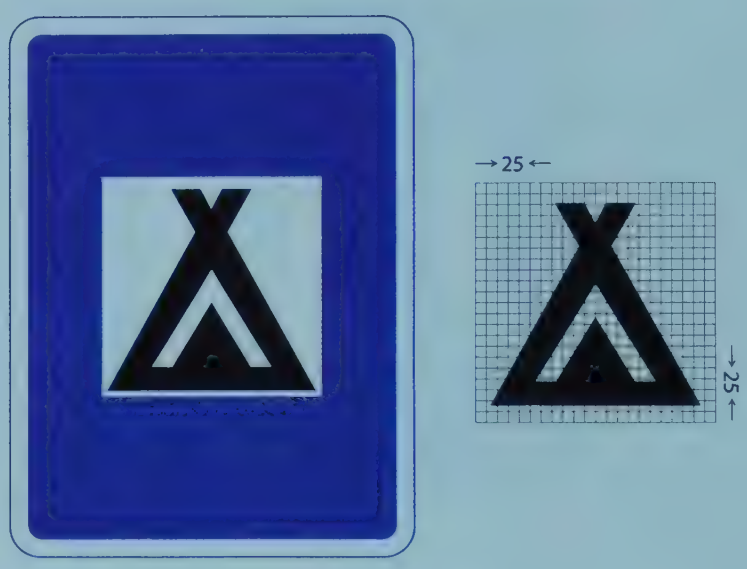


Fig. 17.22 Camp Site

Fig.17.23 Airport

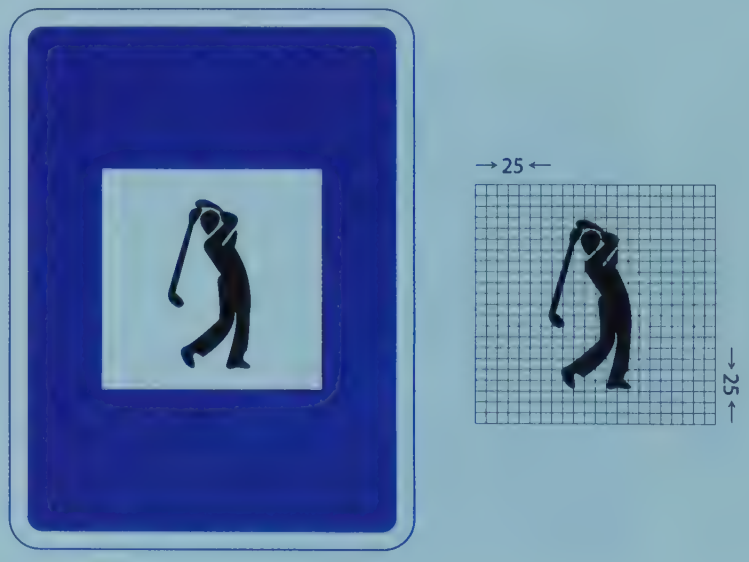


Fig. 17.24 Golf Course

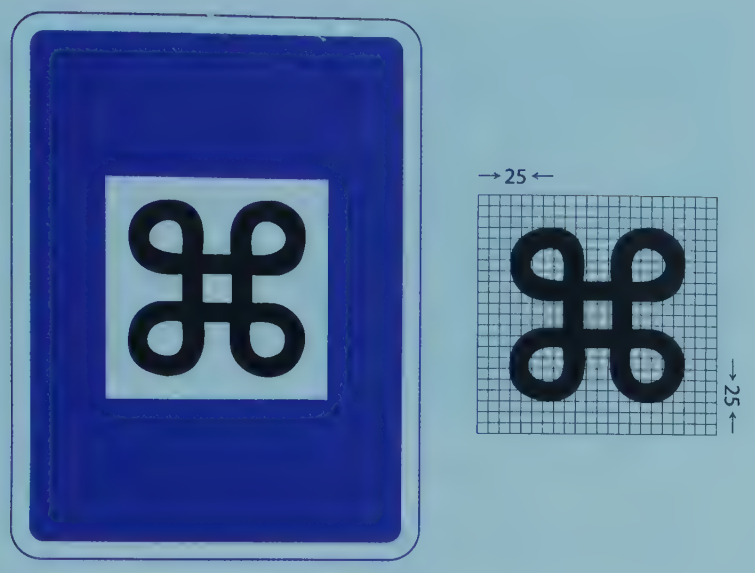


Fig. 17.25 National Heritage

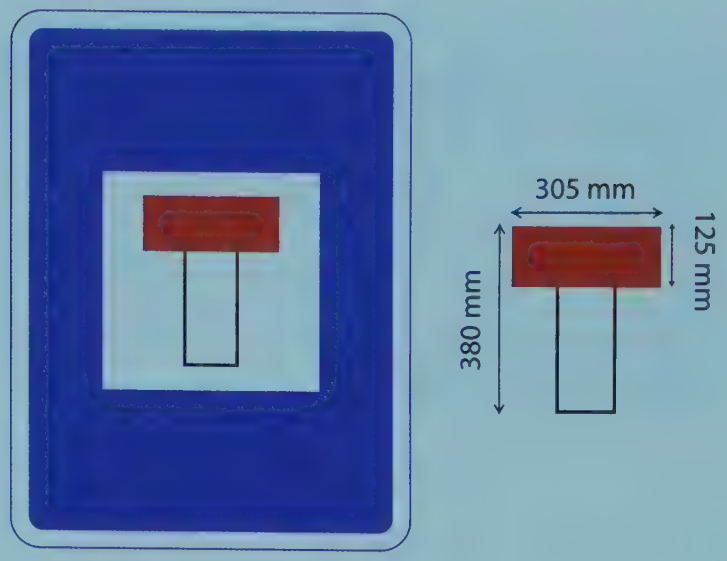


Fig. 17.26 No Through Road

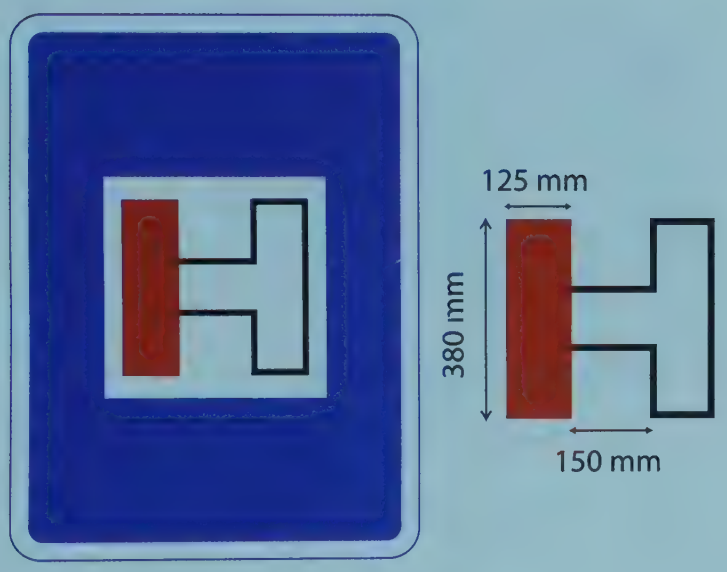


Fig. 17.27 No Through Side Road

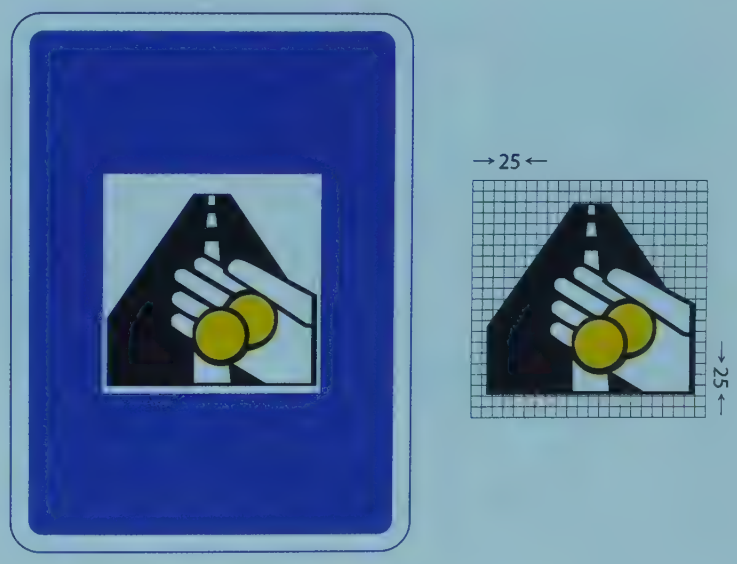


Fig. 17.28 Toll Road Ahead

Fig. 17.29 Guide Sign on ETC Lane

Fig. 17.30 Country Border

PLATE - V (Continued)

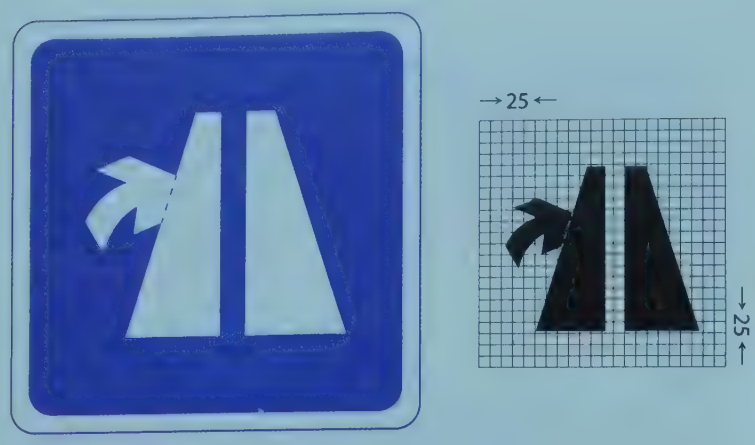


Fig. 17.31 Entry Ramp for Expressway

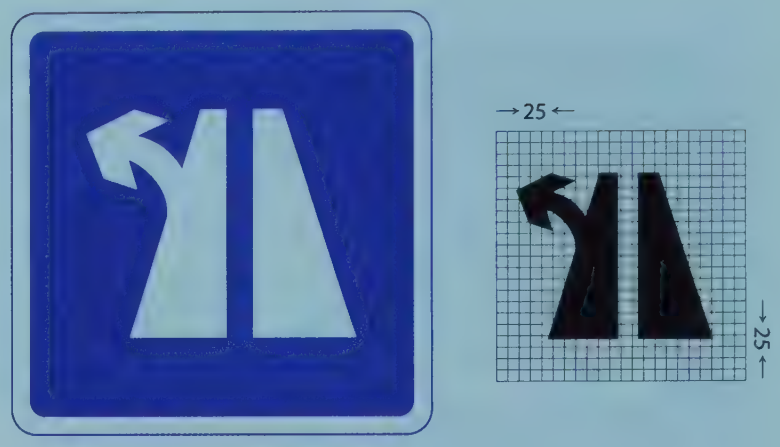


Fig. 17.32 Exit Ramp for Expressway

Fig. 17.33 Expressway Symbol

Fig. 17.34 End of Expressway

Fig. 17.35 Bus Stop

Fig. 17.36 Bus Lane

Fig. 17.37 Contra Flow Bus Lane

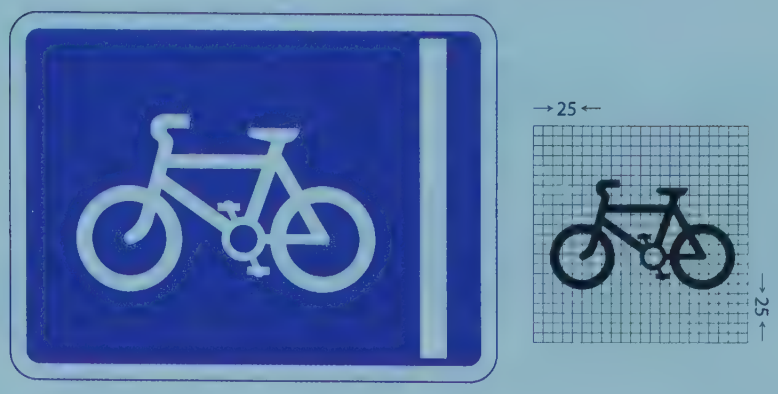


Fig. 17.38 Cycle Lane

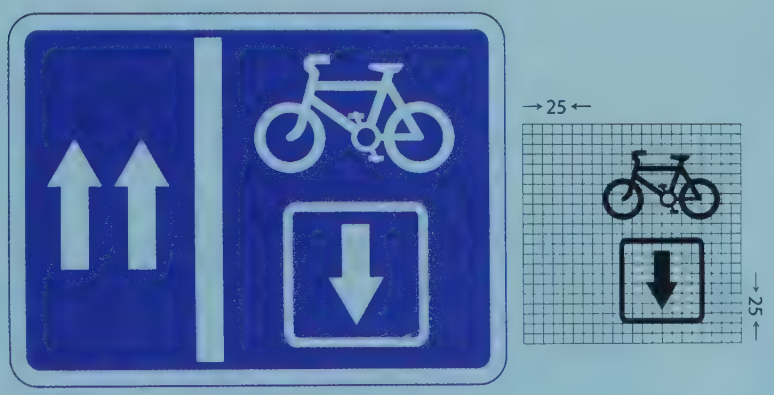


Fig. 17.39 Contra Flow Cycle Lane

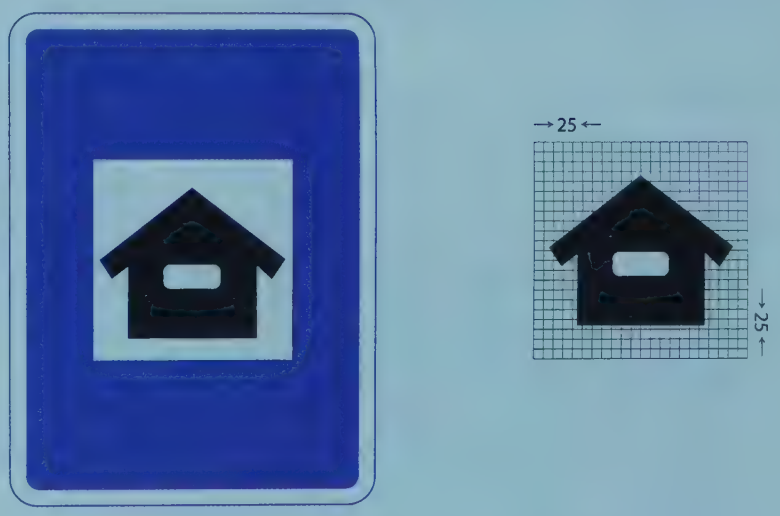


Fig. 17.40 Holiday Chalets

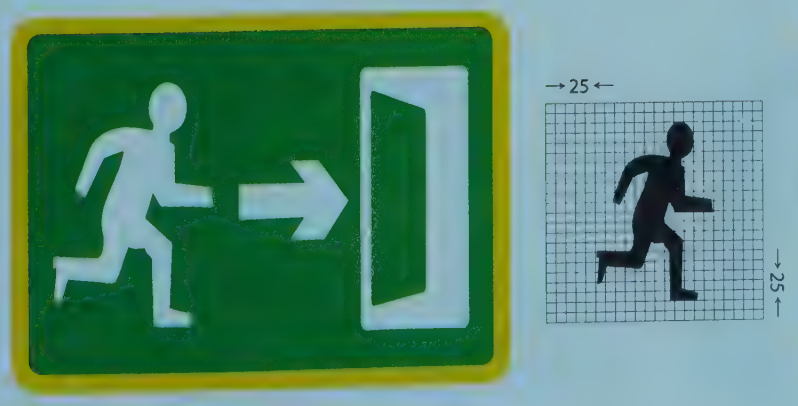


Fig. 17.41 Emergency Exit

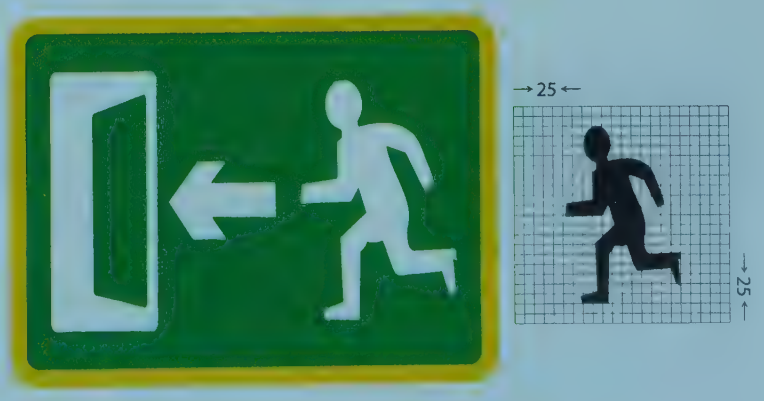


Fig. 17.42 Emergency Exit

PLATE - V (Continued)

Fig. 17.43 Emergency Helpline Number

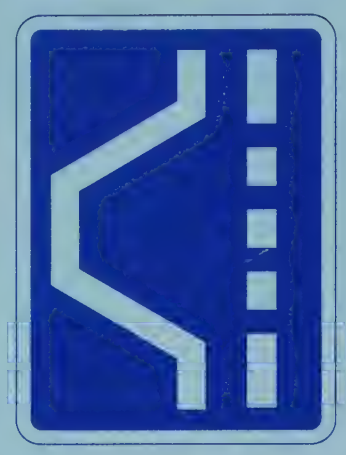


Fig. 17.44 Emergency Lay-by

Fig. 17.45 Fire Extinguisher

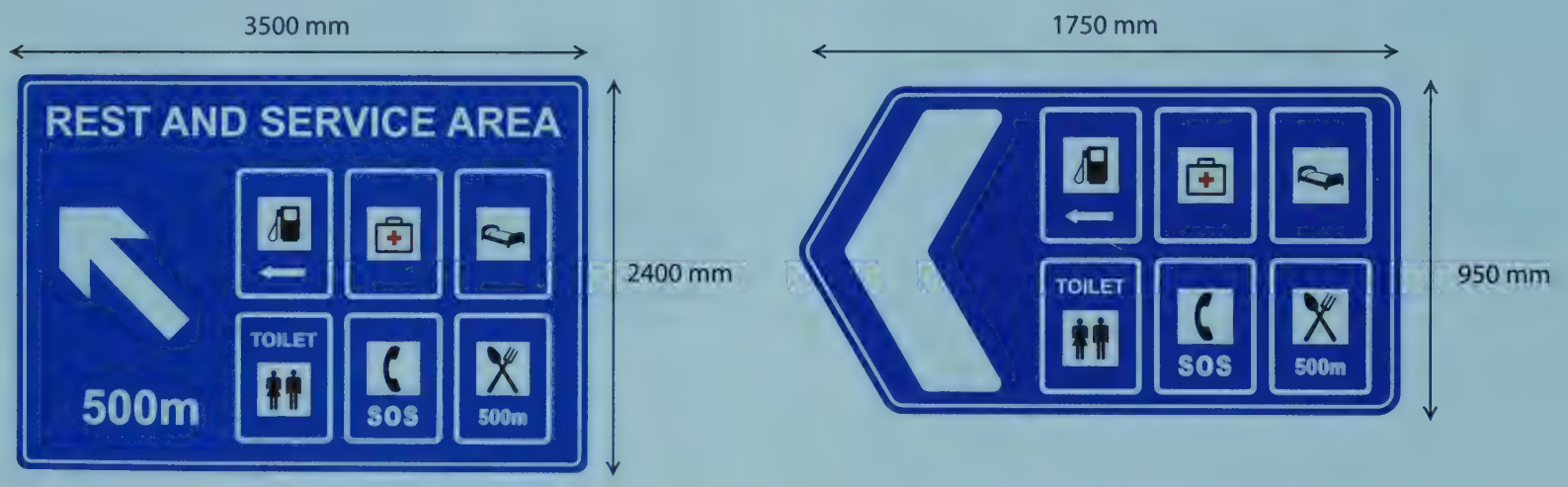


Fig. 17.46 Rest and Service Area Sign

Fig. 17.47 Pedestrian Crossing Informatory Sign

Fig. 17.48 Speed Breaker Informatory Sign

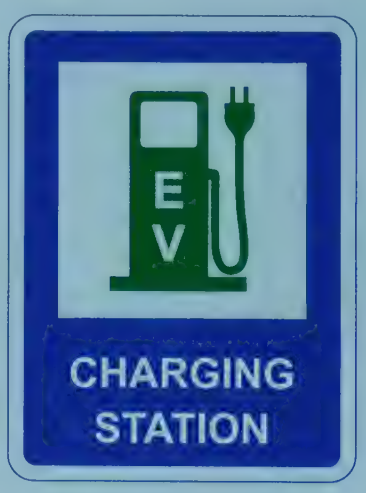


Fig. 17.49 Electric Vehicle Charging Station Informatory Sign

PARKING SIGNS

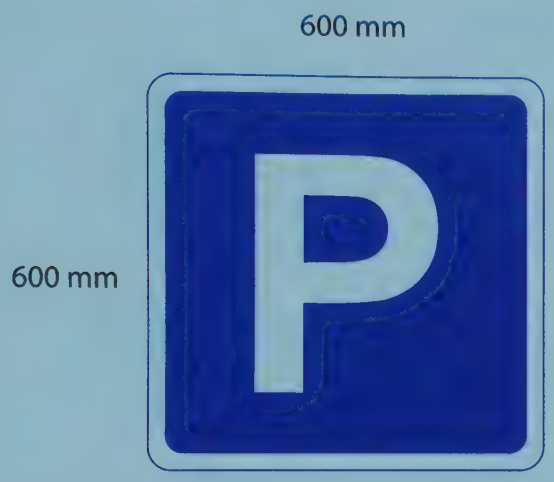


Fig. 18.01 Parking

Fig. 18.02 Auto Rickshaw Parking

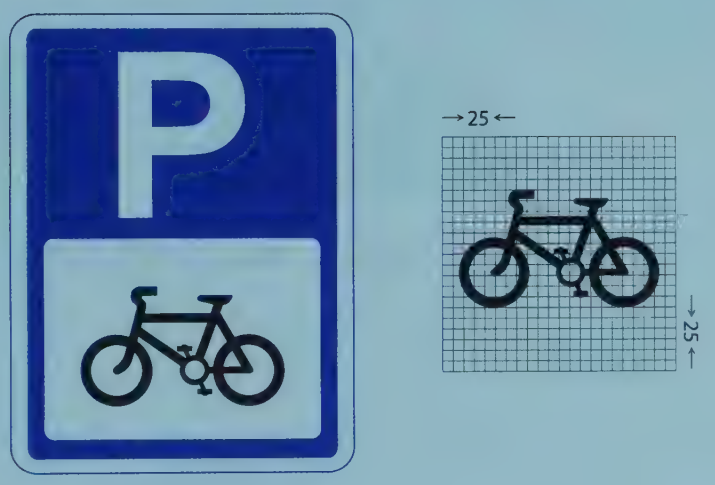


Fig. 18.03 Cycle Parking

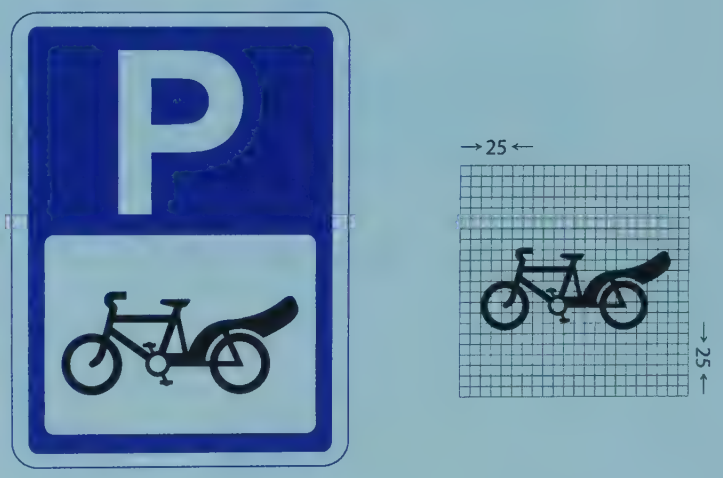


Fig. 18.04 Cycle Rickshaw Parking

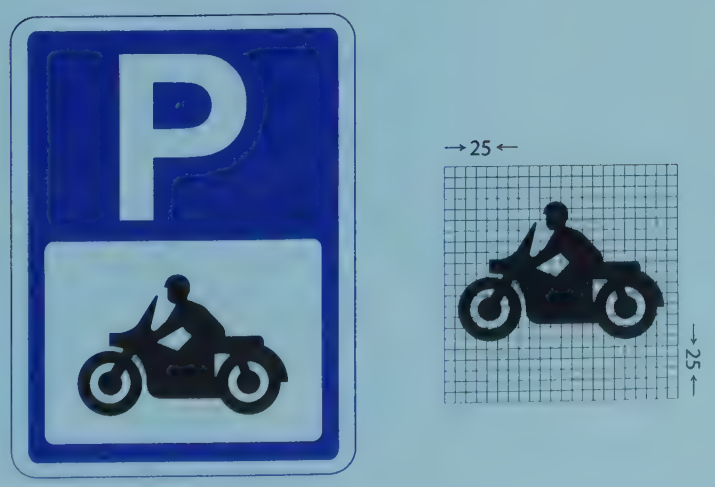


Fig. 18.05 Scooter and Motorcycle Parking

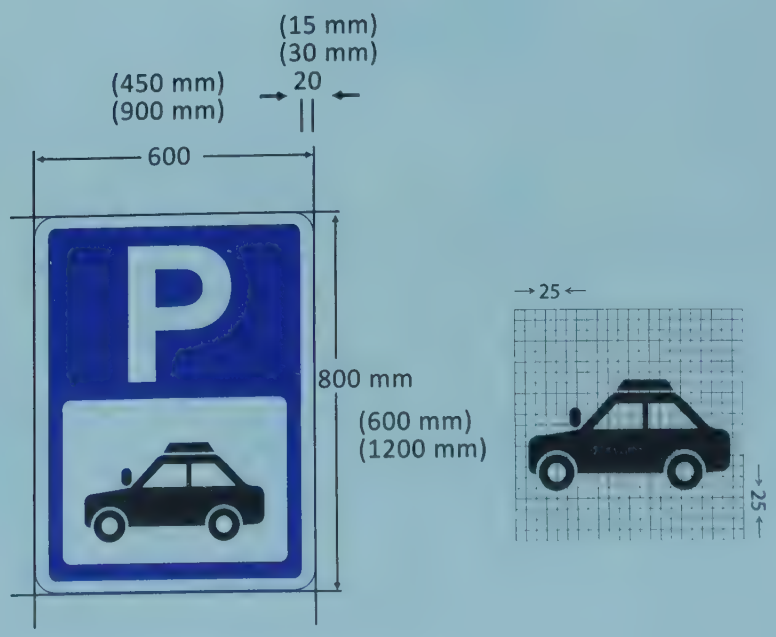


Fig. 18.06 Taxi Parking

PLATE - V (Continued)

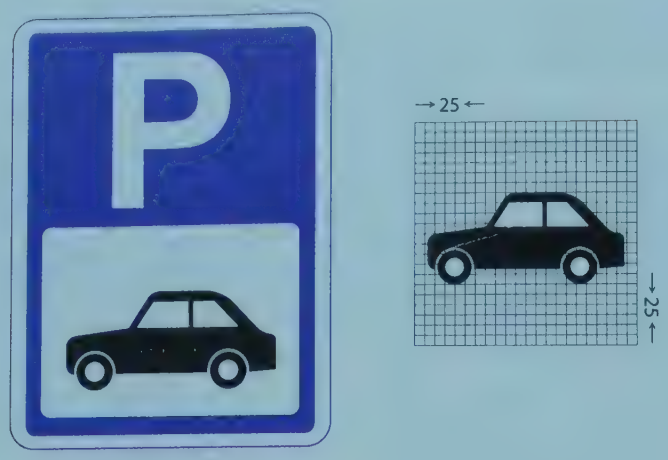


Fig. 18.06a Car Parking

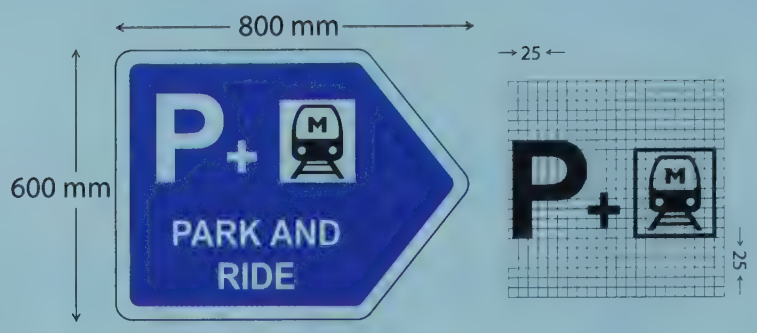


Fig. 18.07 Park and Ride (by Metro)

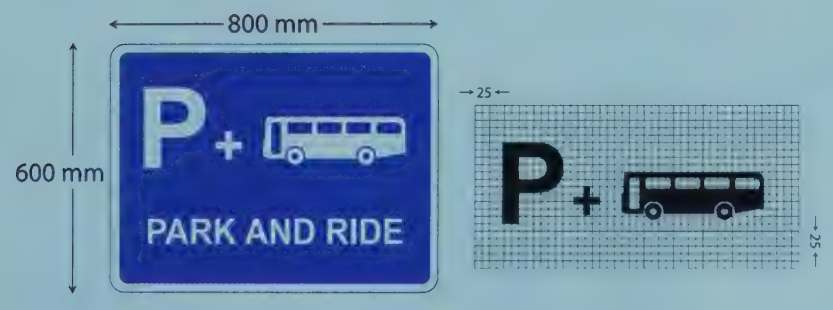


Fig. 18.08 Park and Ride (by Bus)

Fig. 18.09 Pickup and Drop Point

Fig. 18.10 Parking Restriction Signs for Traffic Management

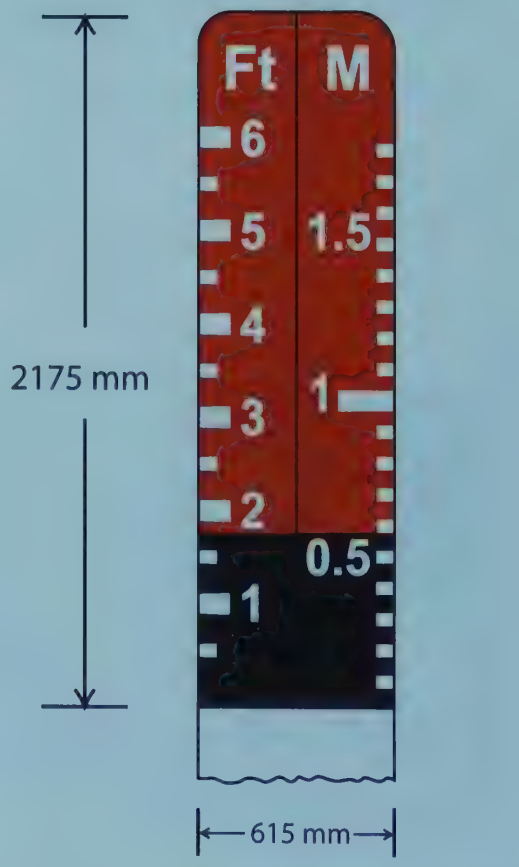


Fig. 18.11 Flood Gauge

SIGNS FOR DIFFERENTLY ABLED PERSONS

Fig. 19.01 International Symbol of Accessibilty

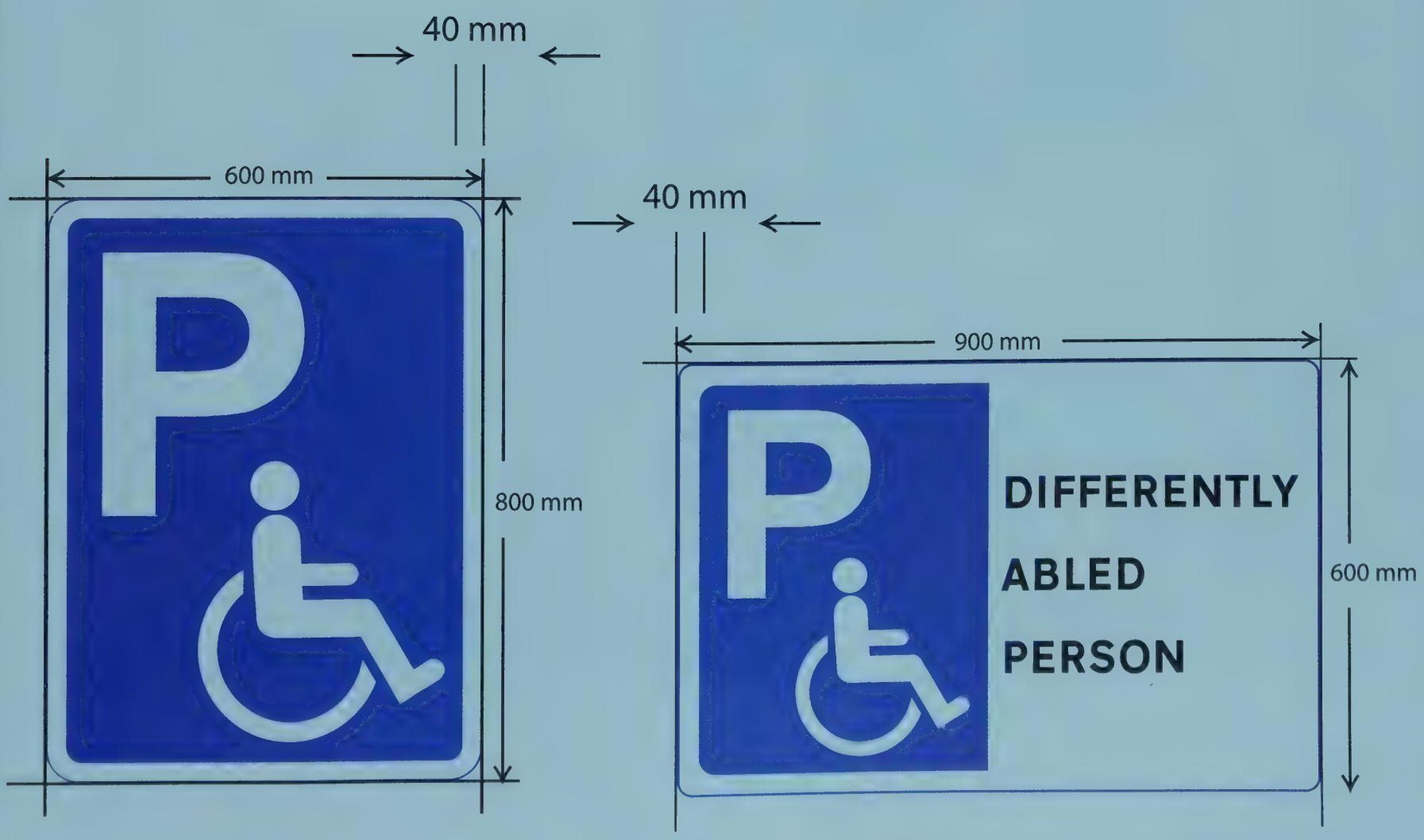


Fig. 19.02 Parking Information

PLATE - V (Continued)

Fig. 19.03 Parking Areas

Fig. 19.04 Ramped Entrance to Subway/Over Bridge

PLATE - V (Continued)

Fig.19.05 Toilet Facilities

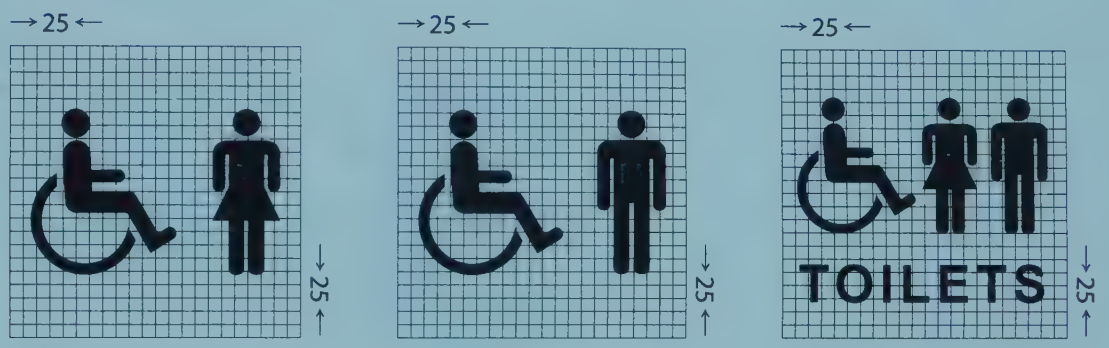


Fig.19.06 Way Finding

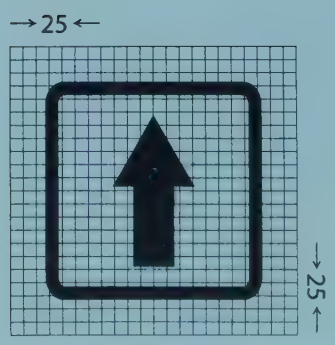


PLATE - V (Continued)

ENFORCEMENT RELATED SIGNS

Fig. 20.01 Red Light Violation Penalty Information Sign

Fig. 20.02 Stop Sign Violation Penalty Information Sign

PLATE - V (Continued)

D: Diameter of the Speed Limt Sign as per Design Speed
T: Thickness of the border of the Speed Limit Sign
(Refer Table 14.3)

Fig. 20.03 Speed Camera

PLATE - V (Continued)

Fig. 20.04 Vehicle Category Wise and Speed Wise Lane Dedication Information Signs

PLATE - V (Continued)

Fig. 20.04a Vehicle Category wise lane dedication information Signs (Shoulder Mounted)

PLATE - V (Continued)

Fig. 20.05 Tow Away Zone Sign

Fig. 20.06 Lane Priority Signs for Emergency Vehicles

ROUTE MARKER SIGNS

Fig. 22.01 State Highway
Route Marker Sign

Fig. 22.02 National Highway
Route Marker Sign

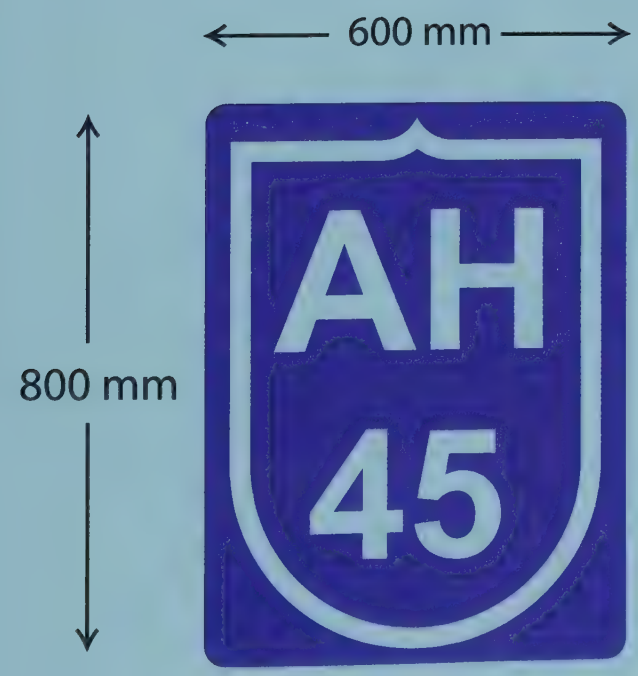


Fig. 22.03 Asian Highway
Route Marker Sign

Fig. 22.04 Expressway
Route Marker Sign

SIGNS RELATED TO URBAN SCENARIO

Fig. 24.01 Finger Type Signages for Pedestrian Predominant Street

Fig. 24.02 Landmark Identification Sign

Fig. 24.03 Street Name Board

TOLL PLAZA RELATED SIGNS

Fig. 25.01 Toll Plaza Ahead Overhead Cantilever Sign

Fig. 25.02 Toll Plaza Lane Information Overhead Sign

PLATE - VII (Continued)

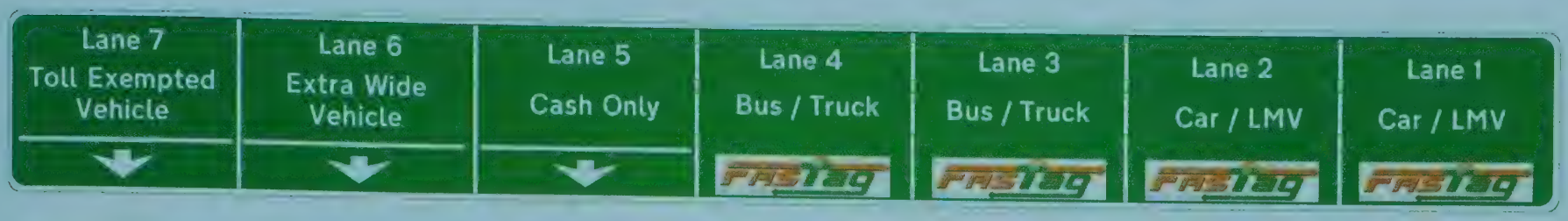


Fig. 25.03 Toll Plaza Canopy Sign

Fig. 25.04 For Fast Tag Lanes - at the toll Plaza

USE OF SYMBOLS AND ICONS IN DIRECTION SIGNS

ANNEXURE (I TO VIII)

Annexure - I
(Section 14.1)
LIST OF MANDATORY/REGULATORY SIGNS

I. STOP AND GIVE WAY SIGN

1) Stop
2) Give Way
3) Give Way to Buses Exiting the Bus Bay

II. PROHIBITORY SIGNS

1) Bullock Carts Prohibited
2) Bullock and Hand Carts Prohibited
3) Hand Carts Prohibited
4) Tongas Prohibited
5) Horse Riding Prohibited
6) Auto-Rickshaw Prohibited
7) Buses Prohibited
8) Cars Prohibited
9) Trucks Prohibited
10) Tractor Prohibited
11) Construction Vehicle Prohibited
12) Articulated Vehicles Movement Prohibited
13) Two-Wheeler Prohibited
14) Cycles Prohibited
15) Pedestrian Prohibited
16) Horn Prohibited
17) No Entry
18) One Way
19) Left Turn Prohibited
20) Right Turn Prohibited
21) Overtaking Prohibited
22) U-Turn Prohibited
23) Right Turn & U-Turn Prohibited
24) Priority to Vehicles from the Opposite Direction
25) Free Left Turn Prohibited at Signal

III. NO PARKING AND NO STOPPING SIGNS

1) No Standing
2) Definition Plate to Fig. 14.29
3) No Stopping
4) Definition Plate to Fig. 14.30
5) No Parking
6) Definition Plate to Fig. 14.31 (Optional)
7) Parking not Allowed on Footpath
8) Parking not Allowed on Half of Footpath

IV. VEHICLE CONTROL SIGNS AND SPEED LIMIT

1) Axle Load Limit
2) Height Limit
3) Length Limit
4) Load Limit
5) Width Limit
6) Maximum Speed Limit
7) Maximum Speed Limit (Vehicle Type)
8) Stop for Police Check

V. RESTRICTION ENDS SIGN

1) Restriction Ends

VI. COMPULSORY CONTROL AND OTHER SIGNS

1) Compulsory Ahead
2) Compulsory Ahead or Right Turn
3) Compulsory Ahead or Left Turn
4) Compulsory Turn Right
5) Compulsory Turn Left
6) Priority to Vehicles from Right
7) Compulsory Turn Right (In Advance of Junction)
8) Compulsory Turn Left (In Advance of Junction)
9) Compulsory Keep Left
10) Compulsory Keep Right
11) Pass Either Side
12) Minimum Speed Limit
13) Compulsory Cycle Track/Cycle Only
14) Compulsory Cyclist and Pedestrian Route
15) Pedestrian Only
16) Compulsory Snow Chain
17) Bus Way/Buses Only
18) Compulsory Sound Horn

Annexure - II
(Section 15.1)
LIST OF CAUTIONARY/WARNING SIGNS

1) Left Hand Curve
2) Left Side Road on Left Curve
3) Right Side Road on Left Curve
4) Cross Road on Left Curve
5) Staggered Intersection on Left Curve
6) Right Hand Curve
7) Left Side Road on Right Curve
8) Right Side Road on Right Curve
9) Cross Road on Right Curve
10) Staggered Intersection on Right Curve
11) Right Hairpin Bend
12) Left Hairpin Bend
13) Right Reverse Bend
14) Left Reverse Bend
15) Series of Bends
16) Degree Loop
17) Side Road Right
18) Side Road Left
19) Y-Intersection
20) Cross Road
21) Roundabout
22) Traffic Signals
23) T-Intersection
24) T-Intersection Major Road Ahead
25) Major Road Ahead
26) Staggered Intersection
27) Merging Traffic Ahead (From Left)
28) Merging Traffic Ahead (From Right)
29) Narrow Road Ahead
30) Road Widens
31) Narrow Bridge Ahead
32) Steep Ascent
33) Steep Descent
34) Reduced Carriageway (Left Lane (s) Reduced)
35) Reduced Carriageway (Right Lane (s) Reduced)
36) Start of Dual Carriageway
37) End of Dual Carriageway
38) Gap in Median
39) Pedestrian Crossing
40) School Ahead
41) Built Up Area
42) Two Way Operation
43) Two Way Traffic on Cross Road Ahead Warning

44) Lane Closed (Two Lane Carriageway)
45) Lane Closed (Three Lane Carriageway)
46) Lane Closed (Four Lane Carriageway)
47) Traffic Diversion on Dual Carriageway
48) People at Work
49) Danger Warning
50) Differently Abled Persons Likely on Road Ahead
51) Deaf Persons Likely on Road Ahead
52) Blind Persons Likely on Road Ahead
53) Cycle Crossing
54) Cycling Route Ahead
55) Dangerous Dip
56) Speed Breaker
57) Rumble Strip
58) Rough Road
59) Soft Verges
60) Loose Gravel
61) Slippery Road
62) Slippery Road because of Ice
63) Opening or Swing Bridge
64) Overhead Cables
65) Playground Ahead
66) Quay Side or River Bank
67) Barrier
68) Sudden Side Winds
69) Tunnel Ahead
70) Ferry
71) Trams Crossing
72) Falling Rocks
73) Cattle Crossing
74) Wild Animals
75) Queues Likely Ahead
76) Low Flying Aircraft
77) Unguarded Railway Crossing
78) Guarded Railway Crossing
79) Black Spot/Crash Prone Area
80) U Turn Ahead
81) Single Chevron (Normal)
82) Single Chevron (>100Kmph Speed)
83) Double Chevron
84) Triple Chevron
85) Object Hazard (Left)
86) Object Hazard (Right)
87) Two Way Object Hazard Marker

Annexure - III
(Section 16.1)
RULES AND TECHNICAL ADVISORY FOR DESIGN OF INFORMATORY ROAD SIGNS

Annexure III is divided into two parts: Part I lists all the types of direction and place identification signs and Part II describes the rules for designing the direction signs.

I. LIST OF DIRECTION AND PLACE IDENTIFICATIONS SIGN

1) Stack Type Advance Direction Sign (Shoulder Mounted) **Fig. 16.01**
2) Inclusion of Cautionary and Regulatory Signs in Advance Direction Signs **Fig. 16.01a**
3) Map Type Advance Direction Sign (Shoulder Mounted) **Fig. 16.02**
4) Map Type Advance Direction Sign for Roundabout (Shoulder Mounted) **Fig. 16.03**
5) Flag Type Direction Sign **Fig.16.04**
6) Reassurance Sign **Fig. 16.05**
7) Place Identification Sign **Fig. 16.06**
8) Truck Lay-By Sign **Fig. 16.07**
9) Toll Booth Ahead Sign **Fig. 16.08**
10) Weigh Bridge Ahead Sign **Fig. 16.09**
11) Gantry Mounted Advance Direction Sign Ahead of a Grade Separated Junction **Fig. 16.10**
12) Gantry Mounted Advance Direction Sign Ahead of an At-Grade Junction **Fig. 16.11**
13) Advance Direction Sign for an Interchange in a Full Access Controlled Highway **Fig. 16.12**
14) Lane Dedicated Gantry Signs **Fig. 16.13**
15) Shoulder Mounted Sign in Advance of a Grade Separated Junction in Full Access Controlled Highway **Fig. 16.14a**
16) Shoulder Mounted Sign in Advance of an Interchange **Fig. 16.14b**
17) Expressway Ahead Sign **Fig. 16.15**
18) Gantry Mounted Advance Direction Sign Ahead of a Flyover in Urban/City Roads **Fig. 16.16**
19) Definition/Supplementary Plates **Fig. 16.17**
20) Tourist destination directional Information signs without photographs **Fig. 16.18**
21) Tourist destination directional Information signs with photographs **Fig. 16.19**
22) Finger type Way finding signs for Pedestrians, **Fig. 16.20**
23) Tourist Map Information Sign **Fig. 16.21**
24) Boundary Sign at Entrance to a City / Place, **Fig. 16.22**
25) Boundary Sign at Entrance to a Tourist Destination, **Fig. 16.23**
26) Finger Type Signages for Pedestrian Predominant Street, **Fig. 24.01**
27) Landmark Identification Sign, **Fig. 24.02**
28) Street Name Board, **Fig. 24.03**
29) Toll Plaza related signs, **Fig. 25.01 to Fig. 25.04**

II. RULES FOR DESIGN OF DIRECTION INFORMATION SIGN

The rules for design of direction information sign given in following subsections shall be read in conjunction with the pictorial presentation in **Plate-III** and all direction boards shall be designed accordingly. It should be noted that **Plate-III** has not been shown in colour since colour pattern for different kind of roads varies and the colour pattern shall be taken from **Table 8.3**.

1) Alphabets

The "Transport Medium" font shall be used for English and "Hindi7" or "Narad Bold" for Hindi and for regional language it shall be as per local practice. The arrows for directions boards shall also be taken from "Transport Medium" font. The height of lettering for design of direction sign shall be taken from **Table 12.1** for the speed of the road in which the sign is to be placed.

2) Common Principles for design of layouts for Direction Signs

The common principles to be observed while designing shoulder and gantry mounted direction signs are given in the subsection below and the specific principles for different type of direction board are given under respective subsections. The common principles for design of direction boards **(Fig. 16.01 to 16.16)** are:

- The height mentioned in **Table 12.1** refers to the height of lower case "x" and upper case shall be 1.4 times of lower case "x" height.
- The design pattern shown in **Figs. 16.01 to 16.16** expressed the design of layout of direction sign in terms of stroke width and "x" height. Stroke width (s/w) shall be ¼ of lower case "x" height.
- All place names on a sign shall be in letters of the same size, regardless of the relative importance of the place name. A smaller letter size may only be used for a name which is too long to fit into a reasonable sized sign and which cannot be hyphenated or abbreviated. Alternatively, the place names having two or more words can be given in two lines if required.
- English Letters are generally placed in an imaginary tile of 2 times "x" height i.e. 8 s/w height and the placement of English lettering is pictorially presented in **Fig. 16.01** whereas as Hindi/Regional language lettering shall be placed within 9 s/w height. A clear gap of ½ s/w shall be left in between the Regional language tile and English language tile
- Related words on the same line shall be separated by 1 ½ s/w.
- Route letters and route number shall be separated by 1 ½ s/w.
- Route letters shall be 2 s/w away place name when on same line.
- There shall be 3 s/w spaces between a route number and a bracketed route number on same line.
- The border shall be 1 ½ s/w wide.
- Internal corner radius of outer border shall be 1 ½ s/w and other internal radius shall be 1 s/w
- Within panel, the borders shall be separated from the top and sides of imaginary tile by 2 ½ s/w and on bottom by 1 ½ s/w.
- For gantry mounted directions signs, the number of destination names above a single carriageway lane shall be limited to two.

- For inclusion of Cautionary and Regulatory Signs inside the direction informatory boards, the standard sizes of signs as prescribed in **Table 14.4, 14.6** and **15.1** shall be placed between the destination name tiles and arrows with a minimum clearance of 2 ½ s/w from all sides.
- The distance to the destinations may also be placed centred in between the destination name tiles and arrow markings with a spacing of 2 ½ s/w from the edges.

In addition to the common principles laid out in this section, the specific principles for design of different types of signs are given in following sections:

3) Layouts of Stack Type Advance Direction Signs (ADS) (Fig. 16.01)

- Forward destination and arrow shall be the top panel and shall be right aligned.
- Left destination and arrow shall be the second panel and shall be left aligned.
- Right destination and arrow shall be the third panel and shall be right aligned.
- The arrows other than the right angle shall be set at 45 degree.
- Figured kilometre if at all given shall be on the same line and shall be at a distance of 2 ½ s/w.
- The arrow shall also be transport medium and shall be 16 s/w long and 8 s/w wide and shall be 2 ½ s/w from the border and letterings and shall be placed vertically at centre of panel with equal space from top and bottom border.
- The font height for different speed shall be taken from **Table 12.1** and design is presented pictorially in **Fig. 16.01.**

4) Layouts of Map Type ADS (Fig. 16.02), other than Roundabouts

- The width of route symbol (W) shall be 6 s/w when indicating a NH and SH and Urban roads and 4 s/w for MDR and 2 ½ s/w for village roads.
- The arrow heads of route symbol shall be having a base of 1.66 W and height of 1W.
- Side turning symbol shall be extended 2/3rd of distance from the forward symbol to the border as shown in **Fig. 16.02.**
- When there is more than one destination related to a route symbol, all places names should be stacked, with their initial letter aligned. Initial letter of English and Hindi should also be aligned.
- Forward destination shall be centered on the forward route symbol.
- The map type signs with only one side turning, the forward destination shall be displaced from the centre to range right or left with outside extremity of the right or left turning destinations.
- Back and side destinations shall normally be below the route symbol and shall be placed at 18 s/w from forward destination.
- There shall be a minimum of 3 s/w between vertical route symbol and the nearest place name or route number laterally and minimum 2.5 s/w vertically between the route symbol and place name.
- Forward symbol shall be minimum of 12 s/w and imaginary tile of destination name shall be placed above the route symbol.
- The bottom of forward symbol shall be 1 ½ s/w from bottom border.

- The orientation of the route symbols may be varied in multiples of 22.5^0 and staggering may be depicted as per the existing junction layout with an upper limit in staggering distance as "SL" equivalent to 2W.
- The font height for different speed shall be from **Table 12.1.**

5) Layouts of Map Type ADS (Fig. 16.03), for Roundabouts

- The width of route symbol shall be 6 s/w when indicating a NH, SH and Urban roads and 4 s/w for MDR and 2 ½ s/w for village roads.
- The arrow heads of route symbol shall be having a base of 1.66 W and height of 1W.
- Side turning symbol shall be extended 2/3rd of distance from the forward symbol to the border.
- When there is more than one destination related to a route symbol, all places names should be stacked, with their initial letter aligned. Initial letter of English and Hindi also should be aligned.
- Forward destination shall be entered on the forward route symbol.
- On signs with one side turning, the forward destination shall be displaced from the centre to range right or left with outside extremity of the right or left turning destinations.
- Back and side destinations shall normally be below the route symbol and shall be placed at 18 s/w distance.
- The roundabout symbol shall have 12 s/w outer radius and 7 s/w inner radius and both concentric circles shall be discontinued as shown in **Fig. 16.03.**
- There shall be a minimum of 2 ½ s/w vertically between the route symbol and place name and place name shall be placed horizontally in such a way that imaginary tile touches the imaginary circle of radius 2 s/w more than the outer circle of roundabout symbol.
- Forward symbol shall be minimum of 12 s/w and imaginary tile shall be placed above the route symbol.
- The bottom of forward symbol shall be 1 ½ s/w from bottom border.
- The font height for different speed shall be from **Table 12.1.**

6) Layouts of Flag Type Direction Sign (Fig. 16.04)

- The appropriate end of sign plate shall be chamfered 120 degree, the pointed end being reduced 1 s/w.
- The chevron shall be placed 3 ½ s/w from the end border and 1 ½ s/w from the edge of top and bottom borders.
- Place name shall be separated 1 ½ s/w from the chevron.
- The width of chevron shall be 4 ½ s/w when used with two lines of information, 3½ s/w with one line and 4 ½ s/w with 3 lines and 5 s/w when used with 4 lines.
- The font height for different speed shall be taken from **Table 12.1** (Column 7 & 8). For pedestrian oriented finger type direction signs, smaller font size of 30-50 mm can also be used.

7) Layouts of Reassurance Sign (Fig. 16.05)

- The kilometrage shall be centred over place names and similarly route number if at all used.
- Place names shall be aligned left
- Kilometrage shall follow related place names on the same line and shall be aligned right. There shall be minimum 2 ½ s/w between longest place names and kilometrage.
- The nearest destination shall be the top panel and farthest on bottom panel.
- The font height for different speed shall be from **Table 12.1** (Column 7 & 8).

8) Layouts of Place Identification Sign (Fig. 16.06)

- The lines of legend shall be centered one over the other.
- The font height for different speed shall be from **Table 12.1** (Column 7 & 8).

9) Layouts of Truck Lay-by Sign (Fig. 16.07)

- The length of truck symbol shall be same as that of "Lay-by" writings and vertically shall be placed at 2 ½ s/w from imaginary tile of writings and 2 ½ s/w from top border.
- The arrow shall be 3 s/w from left border and 3 s/w from truck symbol.
- The arrow shall be 20 s/w high and 10 s/w wide and shall be inclined at 45 degree as shown in **Fig. 16.07**.
- The font height for different speed shall be from **Table 12.1** (height shown in Column 7 & 8).

10) Layouts of Toll Booth Ahead Sign (Fig. 16.08)

- The height of barrier symbol shall be 20 s/w and shall be 2 ½ s/w gap from bottom imaginary tile and from left and top borders.
- The arrow shall be 16 s/w and shall be placed 8 s/w from right border as shown in **Fig. 16.08.**
- The font height for different speed shall be from **Table 12.1** (height shown in Column 7 & 8).

11) Layouts of Weigh Bridge Ahead Sign (Fig. 16.09)

- The truck symbol shall be 16 s/w high and shall be placed 2 ½ s/w from the imaginary tile and from top and left border.
- The arrow shall be 16 s/w and shall be placed vertically at the center of imaginary tile and the top border and horizontally at 3 s/w from right border as shown in **Fig. 16.09.**
- The font height for different speed shall be taken from **Table 12.1** (height shown in Column 7 & 8).

12) Layouts of Gantry Mounted ADS Ahead of a Grade Separated Junction (Fig. 16.10)

- The arrow shall be 16 s/w and shall be inclined 45 degree.
- There shall be dividing line of 1 s/w width between panels indicating left and forward destination.
- The lettering on both sides shall be 2 ½ s/w from dividing line as shown in **Fig. 16.10.**
- The font height for different speed shall be taken from **Table 12.1.**

13) Layouts of Gantry Mounted ADS Ahead of an At-grade Junction (Fig. 16.11).

- The arrow shall be 16 s/w and shall be inclined 90 degree or 45 degree depending upon the junction layout.
- There shall be dividing line of 1 s/w width between panels indicating left, forward and right destinations.
- The lettering on both sides shall be 2 ½ s/w from dividing line as shown in **Fig. 16.11**
- If kilometrage is shown, it shall be 2 ½ s/w from destination names.
- The font height for different speed shall be taken from **Table 12.1.**

14) Layouts of ADS Ahead of a Grade Separated Junction of a Full Access Controlled Highway (Fig. 16.12)

- The arrow shall be 16 s/w and shall be inclined 45 degree.
- The left panel shall be for the destination leaving to either left slip road or loop and right panel shall be with forward destinations.
- The distance to exit point shall be shown either in kilometre or metre as shown in **Fig. 16.12.**
- Alternatively, the sign may be designed by stacking the two destinations one above the other with a clear gap of 2 s/w as shown in **Fig. 16.12** (bottom image).
- The exit number may also be provided as an additional plate in case of expressways.
- The font height for different speed shall be from **Table 12.1.** The font height used for the supplementary exit number board shall be half of the actual font size requirement as per **Table 12.1** which implies a height equivalent to 4 s/w for the imaginary text tile.

15) Layouts of Lane Dedicated Gantry Mounted Signs (Fig. 16.13)

- The downward arrow shall be 17 s/w wide and shall be 7 s/w high.
- The distance between two downward arrows i.e. between two pointed ends is width of one lane for the particular highway as shown in **Fig. 16.13.**
- The font height for different speed shall be taken from **Table 12.1.**

16) Layouts of Shoulder Mounted Map Type ADS for Full Access Controlled Highway (Fig. 16.14)

- The width of route symbol shall be 5 s/w.
- Length of left route symbol is 24 s/w as shown in **Fig. 16.14a.**

- In case of multiple exits (cloverleaf interchange), the second exit route shall be represented as in **Fig. 16.14b** with a clear gap of 15 s/w from the top of the first exit destination tile.
- The font height for different speed shall be taken from **Table 12.1.**

17) Expressway Ahead Sign (Fig. 16.15)

- The expressway symbol shall be 16 s/w high.
- Chevron shall be 4 s/w wide as shown in **Fig. 16.15**
- The font height for different speed shall be taken from **Table 12.1**

18) Gantry Mounted Sign Ahead of a Flyover in Urban/City Roads (Fig. 16.16)

- The Flyover symbol and other design shall be as per **Fig. 16.16.**
- The font height for different speed shall be taken from **Table 12.1**

19) Definition/Supplementary Plates (Fig. 16.17)

- The border shall be 1 s/w.
- For definition and supplementary plate, lettering and border shall be black on white background.
- Font height shall be 50 mm to 100 mm depending upon the need

20) Tourism Related Signs (Plate-IV)

- The photographs used for Boundary signs and single destination sign boards shall be having a maximum dimension of 60 s/w by 60 s/w, whereas for multiple destination tourist signs, the picture height shall be limited to 16 s/w.
- The pedestrian-oriented direction signs near tourist locations, especially the finger type direction signs shall be designed with font size of 30-50 mm. For other direction signs, font size shall be as per **Table 12.1.**

21) Enforcement Related Signs (Fig. 20.01 to 20.06)

- The size of the boards may be varied depending upon the font size selected as per **Table 12.1** or based upon the size of regulatory signs included.

22) Signs related to Urban Scenario (Plate VI)

- The pedestrian-oriented direction signs, especially the finger type direction signs used in pedestrian predominant streets shall be designed with font size of 30-50 mm. For other direction signs, font size shall be as per **Table 12.1.**

23) Toll Plaza Related Signs (Plate VII)

- The font height for different speeds shall be taken from **Table 12.1.**
- The downward arrow shall be 17 s/w wide and shall be 7 s/w high
- The Fastag logo shall have a maximum height of 8 s/w

24) Use of Symbols and Icons for Direction Boards (Plate-VIII)

- The icons used shall be having maximum dimension of 16 s/w x 16 s/w square

Annexure - IV

I. FACILITY INFORMATION SIGNS (SECTION 17)

1) Eating Place
2) Light Refreshment
3) Resting Place
4) First Aid Post
5) Toilet
6) Filling Station (Fuel Pump)
7) Hospital
8) Emergency SOS Facility
9) U-Turn Ahead
10) Pedestrian Subway
11) Foot Over Bridge
12) Chair Lift
13) Police Station
14) Repair Facility
15) Railway Station/Metro Station/Monorail Station
16) Public Bike Sharing Stand
17) Cycle Rickshaw Stand
18) Taxi Stand
19) Auto Rickshaw Stand
20) Intermediate Public Transport/Share Taxi Stand
21) Home Zone
22) Camp Site
23) Airport
24) Golf Course
25) National Heritage
26) No Through Road
27) No Through Side Road
28) Toll Road Ahead
29) Guide Sign on ETC Lane
30) Country Border
31) Entry Ramp for Expressway
32) Exit Ramp for Expressway
33) Expressway Symbol
34) End of Expressway
35) Bus Stop
36) Bus Lane
37) Contra Flow Bus Lane
38) Cycle Lane
39) Contra Flow Cycle Lane
40) Holiday Chalets
41) Emergency Exit Right
42) Emergency Exit Left
43) Emergency Helpline Number

44) Emergency Lay-by
45) Fire Extinguisher
46) Rest and Service Area Signs
47) Pedestrian Crossing Informatory Signs
48) Speed Breaker Informatory Signs
49) Electric Vehicle Charging Station Sign

II. PARKING SIGNS AND FLOOD GAUGE (SECTION 18)

1) Parking
2) Auto Rickshaw Parking
3) Cycle Parking
4) Cycle Rickshaw Parking
5) Scooter and Motorcycle Parking
6) Car Parking
7) Taxi Parking
8) Park and Ride
9) Pickup and Drop Point
10) Parking Restriction Sign for Traffic Management
11) Flood Gauge

III. SIGNS FOR DIFFERENTLY ABLED PERSONS (SECTION 19)

1) International Symbol of Accessibility
2) Parking Information
3) Parking Areas
4) Ramped Entrance to Subway/Over Bridge
5) Toilet Facilities
6) Way Finding

IV. ENFORCEMENT RELATED SIGNS (SECTION 20)

1) Red Light Violation Penalty Information Sign
2) Stop Sign Violation Penalty Information Sign
3) Speed Camera
4) Vehicle Category Wise and Speed Wise Lane Dedication Information Signs
5) Vehicle Category Wise Lane Dedication Information Signs (Shoulder Mounted)
6) Tow Away Zone
7) Lane Priority Signs for Emergency Vehicles

V. ROUTE MARKER SIGNS (SECTION 22)

1) State Highway Route Marker Sign
2) National Highway Route Marker Sign
3) Asian Highway Route Marker Sign
4) Expressway Route Marker Sign

VI. SIGNS FOR URBAN AND CITY ROADS (SECTION 24)

1) Finger Type Signages for Pedestrian Predominant Street
2) Landmark Identification Sign
3) Street Name Board

VII. TOLL PLAZA RELATED SIGNS (SECTION 25)

1) Toll Plaza Ahead Overhead Cantilever Sign
2) Toll Plaza Lane Information Overhead Sign
3) Toll Plaza Canopy Sign
4) For Fast Tag Lanes - at the Toll Plaza

Annexure V
(Section 27)

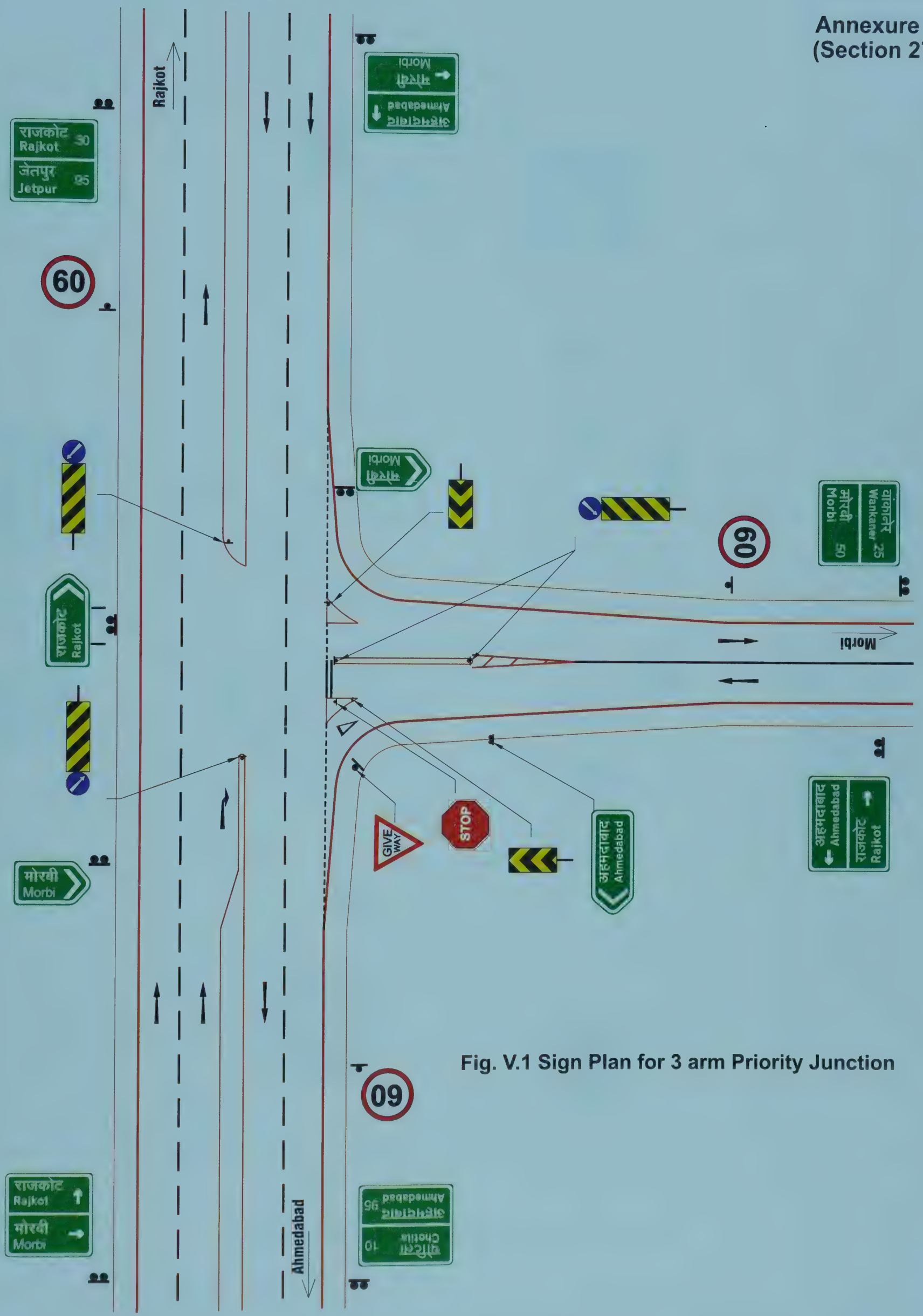


Fig. V.1 Sign Plan for 3 arm Priority Junction

Annexure V

Fig. V.2 Sign Plan for 4 Arm Priority Junction

Annexure V

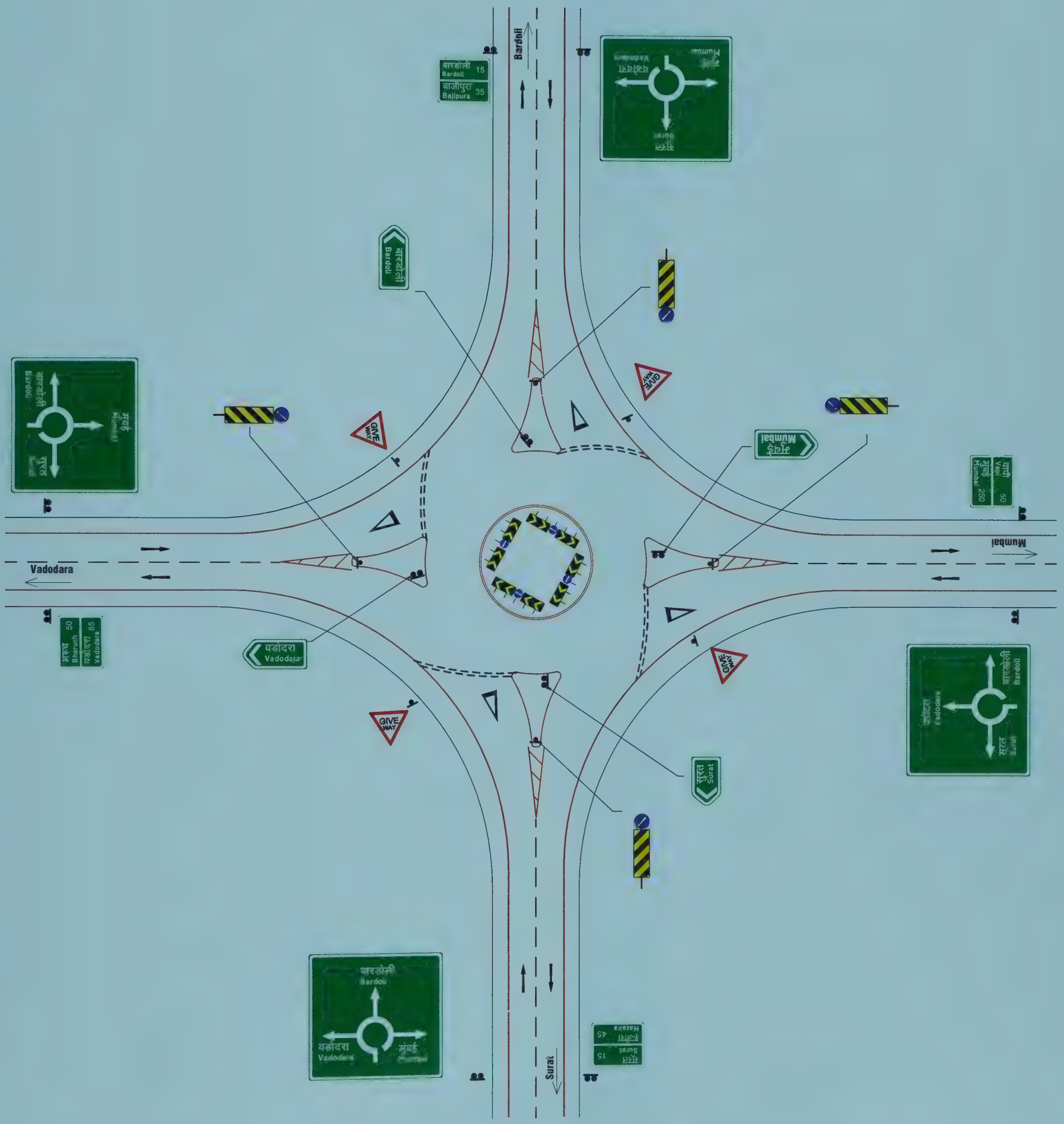


Fig. V.3 Sign Plan for 4 Arm Roundabout

Annexure V

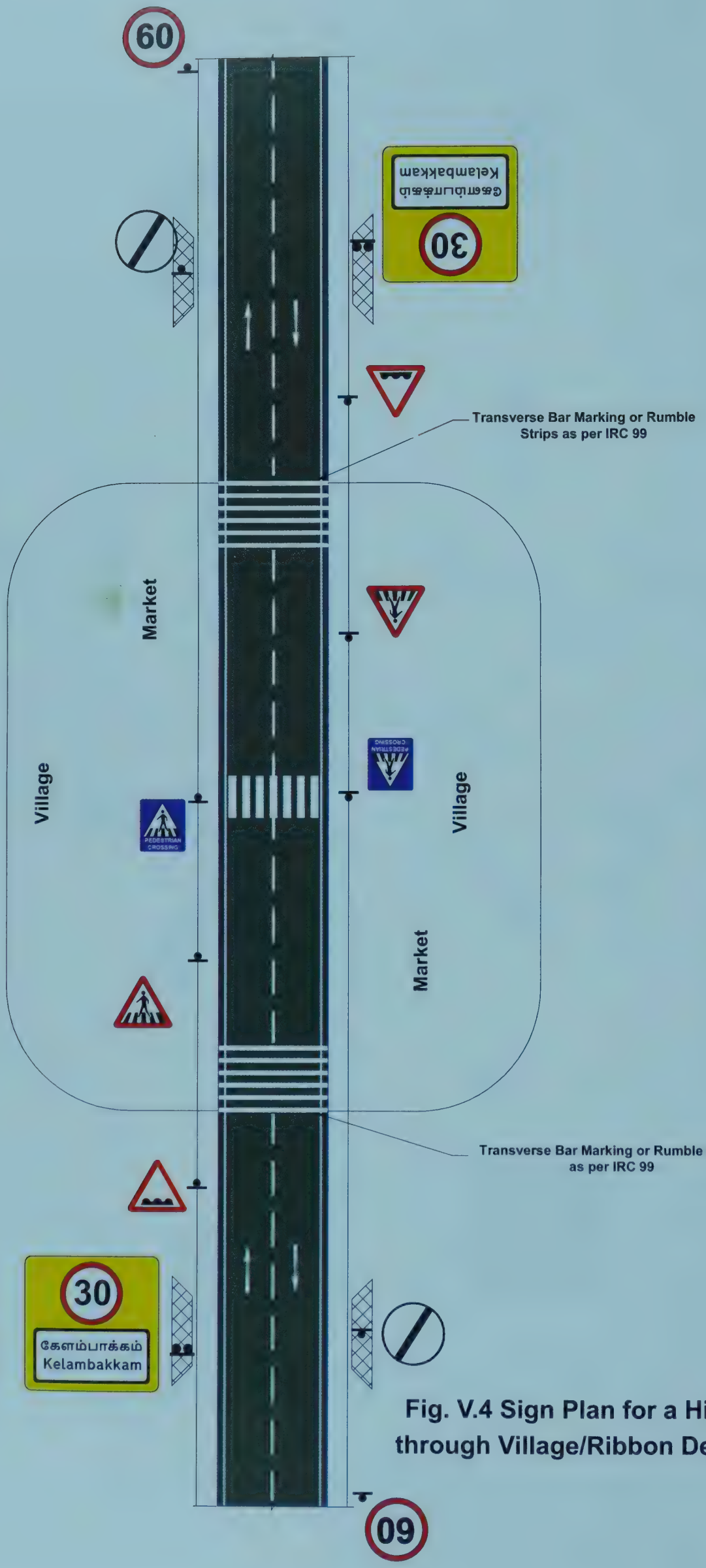


Fig. V.4 Sign Plan for a Highway Passing through Village/Ribbon Development Area

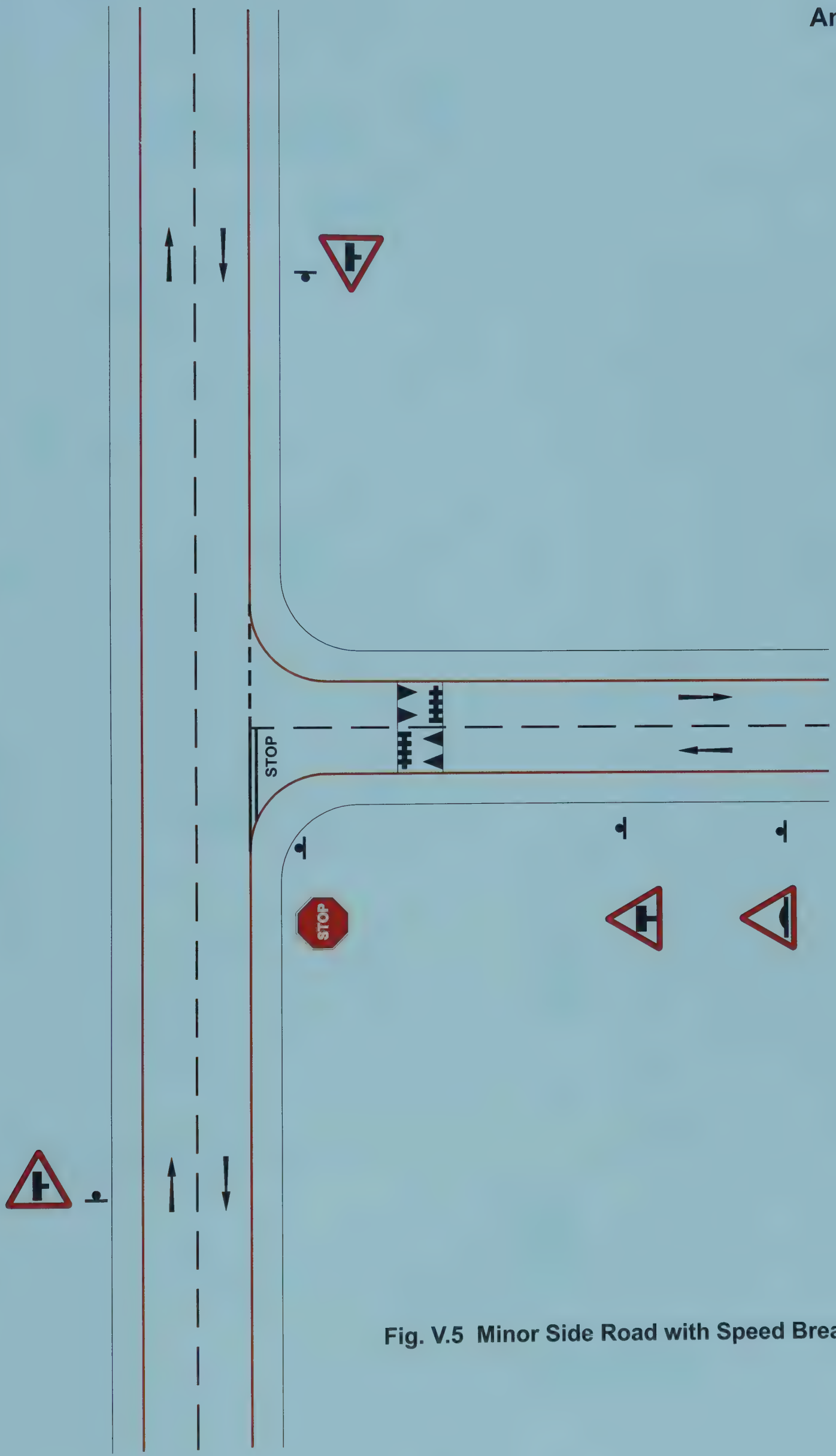


Fig. V.5 Minor Side Road with Speed Breaker

Annexure V

Fig. V.6 Sign Plan for a Flyover Approach in Rural Section

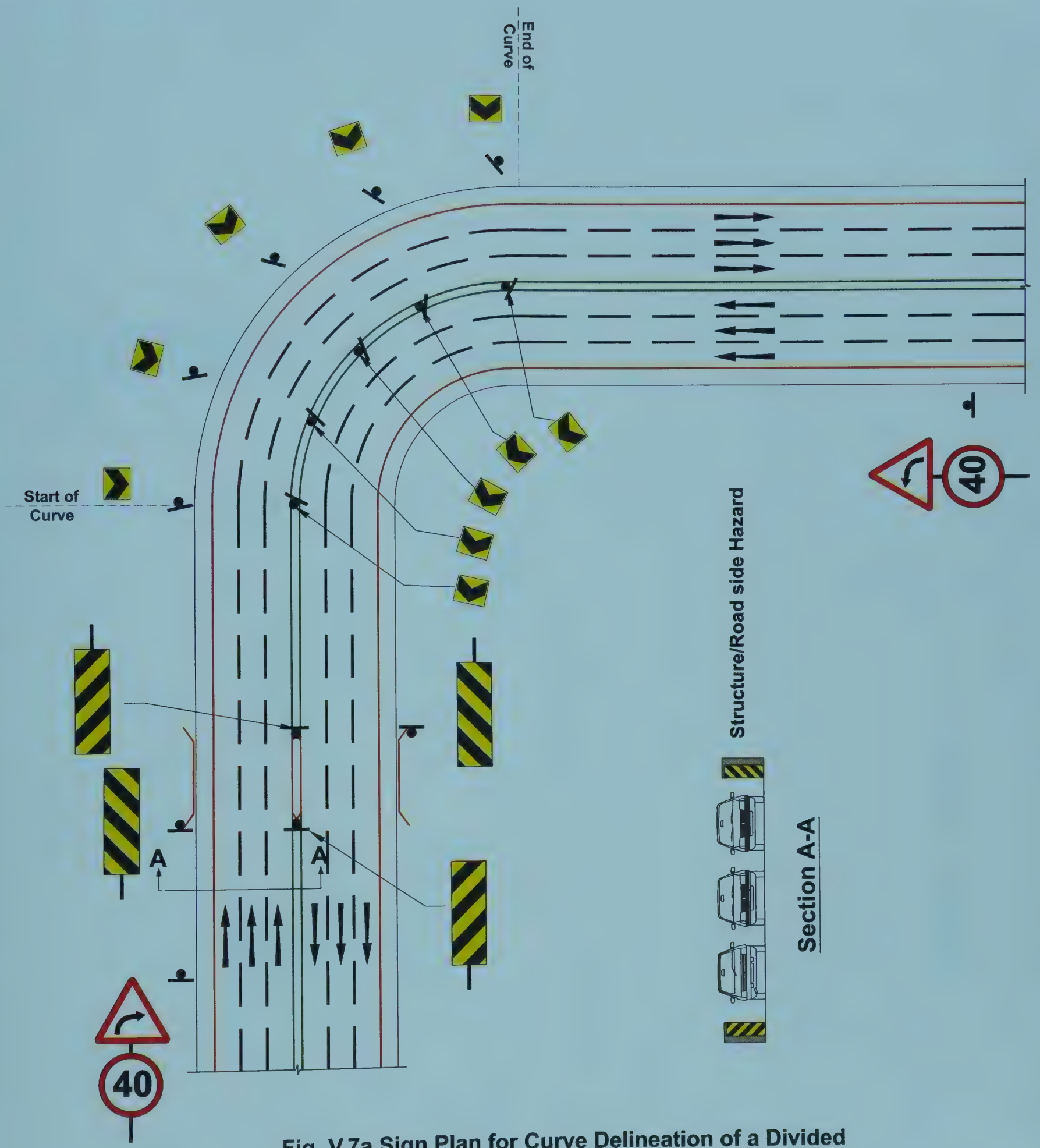


Fig. V.7a Sign Plan for Curve Delineation of a Divided Highway using Series of Single Chevron and Other Associated Signs

Annexure V

Fig. V.7b Sign Plan for Curve Delineation of an Undivided Highway using Series of Single Chevron and Other Associated Signs

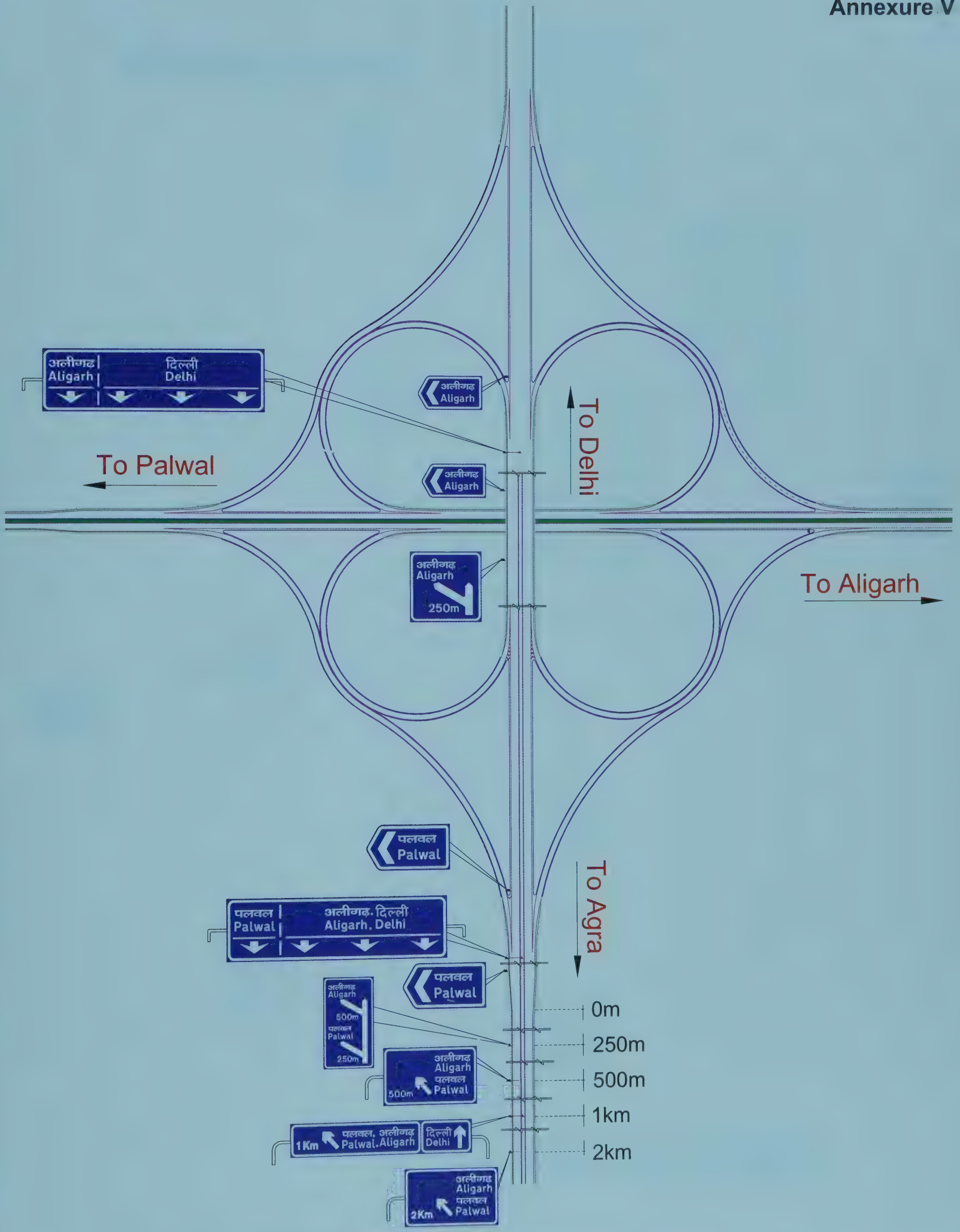


Fig. V.8 Direction Sign Plan for a Cloverleaf Interchange (for Traffic coming Agra side)

Annexure V

Fig. V.9 Sign Plan for a Flyover Approach in Urban Situation

Annexure V

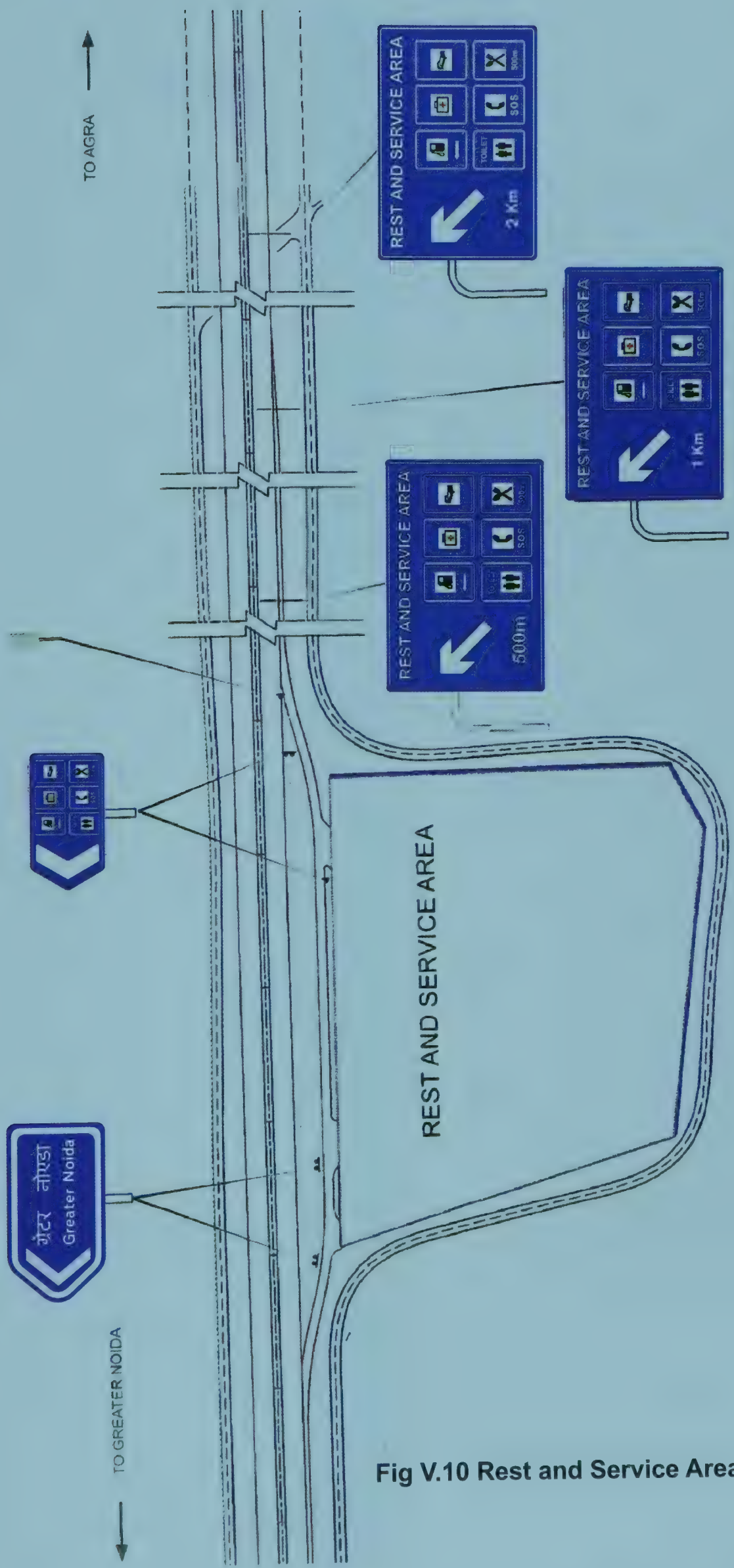


Fig V.10 Rest and Service Area

Annexure V

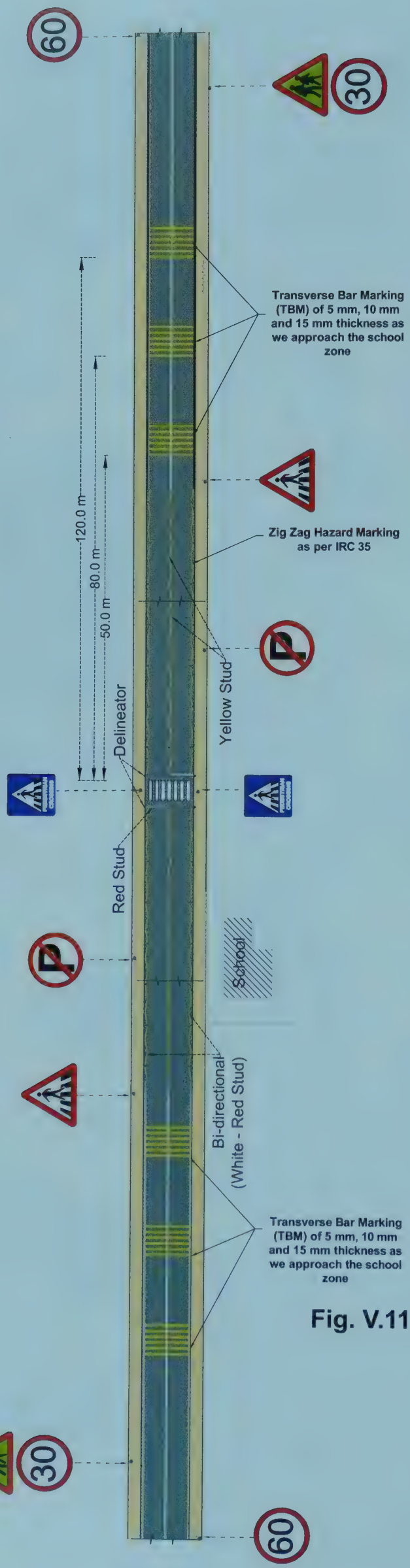

60
30
Transverse Bar Marking (TBM) of 5 mm, 10 mm and 15 mm thickness as we approach the school zone
120.0 m
80.0 m
50.0 m
Zig Zag Hazard Marking as per IRC 35
Delineator
Yellow Stud
Red Stud
School
Bi-directional (White - Red Stud)
Transverse Bar Marking (TBM) of 5 mm, 10 mm and 15 mm thickness as we approach the school zone
30
60

Fig. V.11 Sign Plan for a School Zone

Annexure V

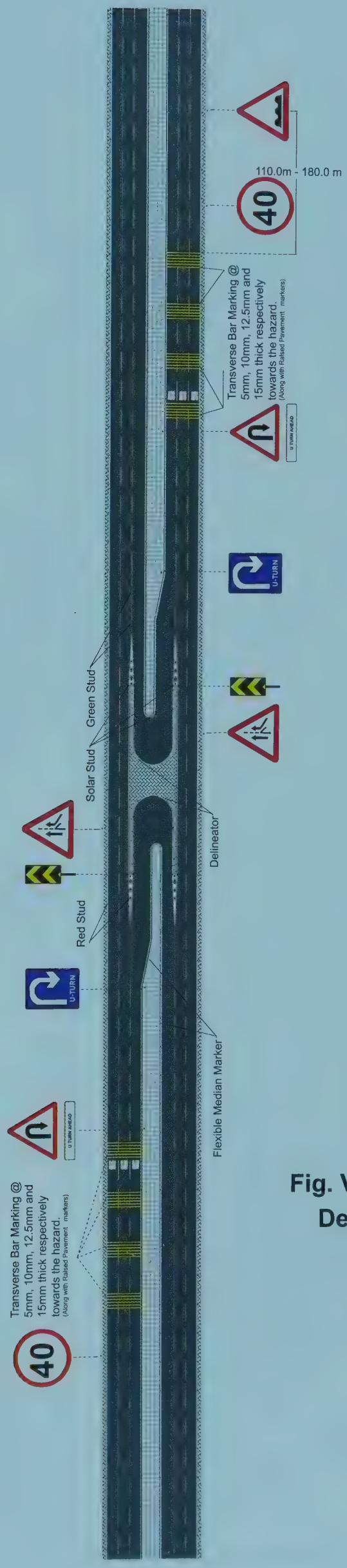


Fig. V.12 Sign Plan for a Typical Dedicated U Turn Location

Annexure V

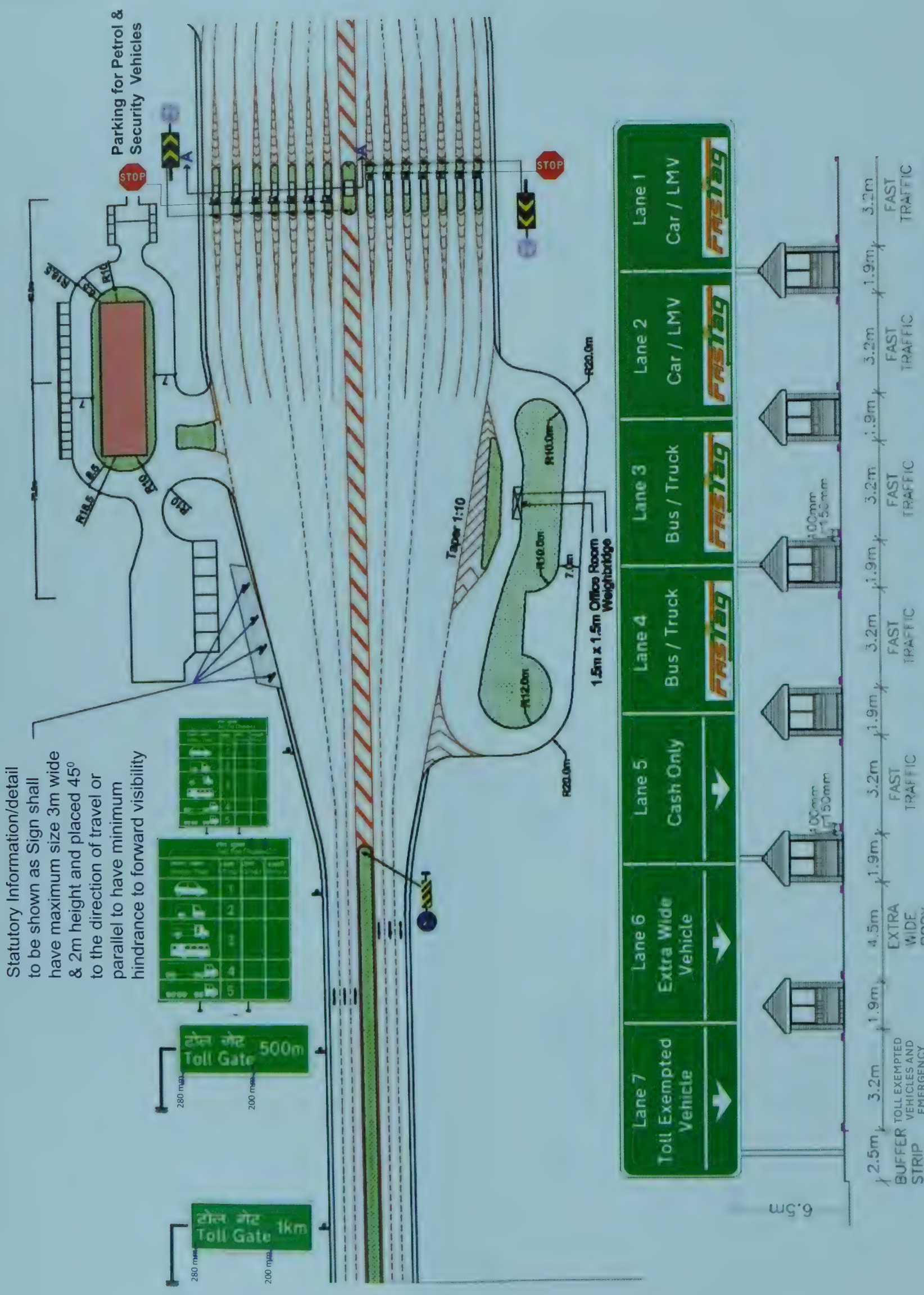


Fig. V.13 Toll Plaza Related Signs

Annexure V

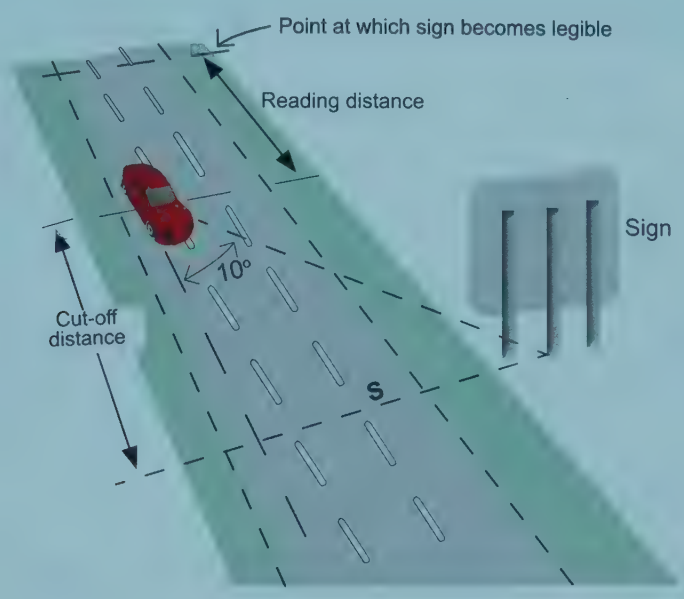
Fig. V.14 Direction Sign Plan for a Diamond Interchange

Annexure V

Fig. V.15 Direction Sign Plan for a Trumpet Interchange

Annexure - VI
(Section 12.2)
DETERMINATION OF "X" HEIGHT FOR DIRECTION SIGNS (SHOULDER & GANTRY MOUNTED)

From the **Fig. VI.1**, it can be observed that "C" is the distance from the sign where a driver is expected to stop reading and comprehending the sign i.e. the point where a driver would turn his head through 10° or more. i.e. C = S x Cotangent 10° = S x 5.7 where "S" is the off-set distance from the centre of the driving lane to the centre of the sign. This is measured from the centre of the right-hand-most lane on a dual carriageway. "R" is the distance travelled while reading the sign. Distance (R) = Reading Time x Speed.



S = Off-set Distance

C = Cut-off Distance

R = Reading Distance

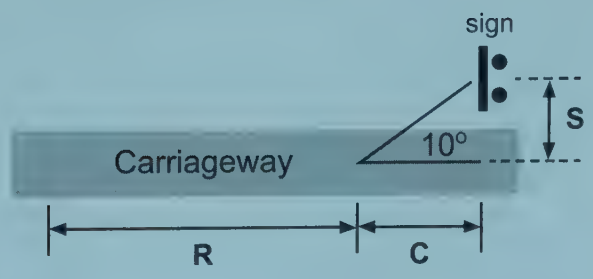


Fig. VI.1 Description of Off-set, Cut-off and Reading Distances

Reading time = 2 + (N/3) seconds; where N is the number of words or destinations on the sign. When N equals 6 the reading time is taken as 4 seconds. The typical values are given **Table VI.1** for different conditions. It allows driver to scan the sign twice to assimilate the information. The sign may be obscured for part of the time by virtue of other vehicles and the driver still needs to pay attention to the road ahead. The x-height of the sign depends on the distance of the driver from the sign when he starts to read it. It is taken that, on average at a distance of 60 meters, the X height should be 110 mm and proportionately at 30 metres, the X-height would be 55 mm. From the first principle, the "X" heights have been determined for various categories of Indian roads, which are given in **Table VI.2 to VI.3**.

Table VI.1 Reading Time for Different Conditions

Constant	Number of Place Names (N)	N/3	Reading Time (sec) [Constant+N/3]
2	6	2.0	4.0
2	6	2.0	4.0
2	8	2.7	4.7

Table VI.2 "X"- Height for Shoulder Mounted Direction Signs

Speed		Reading Time (sec)	Reading Distance (m)	Cotangent (10°)	No of lanes in one direction	Distance from Driving Lane (m)	Cut-off Distance (m)	Total Distance (m)	Upper Case Height (mm)	Lower Case Height (mm)
kmph	m/sec									
30	8.3	4	33.3	5.7	1 Lane	3.75	21.4	54.7	101	72
50	13.9	4	55.6	5.7	1 Lane	3.75	21.4	77.0	143	102
65	18.1	4	72.2	5.7	1 Lane	3.75	21.4	93.6	173	124
80	22.2	4	88.9	5.7	2 Lane	7.75	44.2	133.1	246	176
100	27.8	4	111.1	5.7	2 Lane	9.25	52.7	163.8	303	217
110	30.6	4	122.2	5.7	3 Lane	13.25	75.5	197.7	366	262
120	33.3	4	133.3	5.7	4 Lane	16.75	95.5	228.8	424	303
150	41.7	4	166.7	5.7	4 Lane	17.75	101.2	267.9	475*	340

Consistent with values given in **Table 12.1*

Table VI.3 "X"-Height for Overhead Direction Signs

Speed		Reading Time (sec)	Reading Distance (m)	Cotangent (10°)	No of lanes in one direction	Clear Height (m)	Height Including depth of Gantry (m)	Cut-off Distance (m)	Total Distance (m)	Upper Case Height (mm)	Lower Case Height (mm)
kmph	m/sec										
30	8.3	4	33.3	5.7	1 Lane	6	8	45.6	78.9	146	104
50	13.9	4	55.6	5.7	1 Lane	6	8	45.6	101.2	187	134
65	18.1	4	72.2	5.7	1 Lane	6	8	45.6	117.8	218	156
80	22.2	5	111.1	5.7	2 Lane	6	8.5	48.5	159.6	296	211
100	27.8	5	138.9	5.7	2 Lane	6	8.5	48.5	187.4	347	248
110	30.6	6	183.3	5.7	3 Lane	6	9	51.3	234.6	434	310
120	33.3	6	200.0	5.7	4 Lane	6	9	51.3	251.3	465	332
150	41.7	6	250.0	5.7	4 Lane	6	9	51.3	301.3	530*	380

Consistent with values given in **Table 12.1*

Annexure - VII
(Section 13.2)
FORMAT FOR RECORDING SIGN INSTALLATION INFORMATION FOR MAINTENANCE PURPOSE

Format for recording sign installation information for maintenance purpose include Reference number along with Type of sheeting, Manufacturer name, month and year of installation to be placed on the back of a sign board as given below:

Reference Number	
Project Name/ID	
Sign Manufacturer Name	
Sheeting Manufacturer Name	
Type of Sheeting	TYPE ___.
Month and Year of Installation	___./ 20___.
Any Other details	

Size of Typical QR Code (51 mm x 51 mm)

Annexure - VIII
(Section 13.3)
RECORDING FORMAT FOR PERIODIC TESTING OF RETRO REFLECTIVITY

Coefficient of Retro-reflection (R_A) ($cd.lx^{-1}.m^{-2}$)			
Project Name			
Customer		Sign Location	
Type of Sign		Image	
Date of Installation		Date of Testing	
Colour			
Entrance Angle	Coefficient of Retro-reflection Values (R_A Values)		
	Observation Angle		
	0.2	0.5	1
-4			
Average			
Minimum Value required as per IRC:67/ASTM D 4956			
30			
Average			
Minimum Value required as per IRC:67/ASTM D 4956			
Colour			
Entrance Angle	Coefficient of Retro-reflection Values (R_A Values)		
	Observation Angle		
	0.2	0.5	1
-4			
Average			
Minimum Value required as per IRC:67/ASTM D 4956			
30			
Average			
Minimum Value required as per IRC:67/ASTM D 4956			
Tested by Name & Sign	Sign Manufacturer Authorized signatory	Consultant- Authorized signatory	Customer Authorized signatory

(The Official amendments to this document would be published by the IRC in its periodical, 'Indian Highways' which shall be considered as effective and as part of the Code/Guidelines/Manual, etc. from the date specified therein)

Price : ₹1500/-
(Plus Packing & Postage)